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PUBLIC VERSION

In the published version of this decision, some information has been omitted pursuant to Article 17(2) of Council Regulation (EC) No 139/2004 concerning non-disclosure of business secrets and other confidential information. The omissions are shown thus […]. Where possible the information omitted has been replaced by ranges of figures or a general description.

To the notifying party

Subject: **Case M.9234 — Harris Corporation/L3 Technologies**
Commission decision pursuant to Article 6(1)(b) in conjunction with Article 6(2) of Council Regulation No 139/2004[1] and Article 57 of the Agreement on the European Economic Area[2]

Dear Sir or Madam,

(1) On 26 April 2019**,** the European Commission received notification of a proposed concentration pursuant to Article 4 of the Merger Regulation by which Harris Corporation ('Harris', United States) acquires sole control of the whole of L3 Technologies, Inc. ('L3', United States) within the meaning of Article 3(1)(b) of the Merger Regulation (the 'Transaction').[3] Harris is designated hereinafter as the 'Notifying Party', while Harris and L3 are together referred to as the 'Parties'.

1 OJ L 24, 29.1.2004, p. 1 (the 'Merger Regulation'). With effect from 1 December 2009, the Treaty on the Functioning of the European Union ('TFEU') has introduced certain changes, such as the replacement of 'Community' by 'Union' and 'common market' by 'internal market'. The terminology of the TFEU will be used throughout this decision.

2 OJ L 1, 3.1.1994, p. 3 (the 'EEA Agreement').

3 See publication of the Official Journal of the European Union No C 154/6, 06.05.2019.

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1. THE PARTIES

(2) Harris is an international aerospace and defence technology company that supplies products, systems and services for defence, civil government and commercial applications. Harris is headquartered in Florida, United States and it is listed on the New York Stock Exchange.

(3) Harris' business is structured into three main areas of activity as follows:[4]

i. The *communication systems* segment includes Harris' night vision products, tactical radio communications equipment, including hand held video data links, for military and commercial customers as well as portable radios and other products for police forces.

ii. The *electronic systems* segment includes the supply of electronic warfare equipment (radars, radar deception devices and electronic attack systems that disrupt adversary signals), avionics (equipment and software used in military aircraft), mission networks and other systems.

iii. The *space and intelligence systems* segment includes products such as remote sensing antennas, position and navigation solutions (new generation GPS), systems supporting missile warning systems, tracking software, earth observation solutions, optic solutions for the aerospace industry and environmental solutions (thermometers, barometers etc.).

(4) L3 is an international aerospace and defence systems company that supplies intelligence, surveillance and reconnaissance, communications and electronic systems for military, homeland security and commercial aviation customers. L3 is based in New York, United States and is listed on the New York Stock Exchange.

(5) L3 is structured into three business segments as follows:[5]

i. The *communication and networked systems* segment includes network and communication systems, secure communications products, radio frequency components, satellite communication ("SATCOM") terminals and space, microwave and telemetry products.

ii. The *intelligence, surveillance and reconnaissance* segment includes aircraft missionization and sustainment, as well as a broad range of sensor systems for airborne, war fighter, space and ground platforms.

iii. The *electronic systems* segment includes products and services that serve niche markets such as aircraft simulation and training, cockpit avionics, airport security and precision engagement weapons and systems.

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4 Form CO paragraphs 21-24

5 Form CO paragraphs 27-30

2. THE CONCENTRATION

(6) The Transaction will take place pursuant to the Agreement and Plan of Merger dated 12 October 2018, which provides that a wholly-owned subsidiary of Harris, Leopard Merger Sub Inc., merges with L3 as a result of which L3 becomes a wholly owned subsidiary of Harris.[6]

(7) Upon completion of the Transaction, L3 will be a wholly-owned subsidiary of Harris.

(8) While this suggests that Harris will have sole control of L3, the question of sole or joint control usually depends on the veto rights afforded to the minority shareholder or, potentially, to the target of the acquisition. According to the Commission's Consolidated Jurisdictional Notice under Council Regulation (EC) No 139/2004 on the control of concentrations between undertakings ('Consolidated Jurisdictional Notice') veto rights that confer joint control to the minority shareholders typically involve veto over the budget, business plan and the appointment of the senior management.[7]

(9) In the case at hand, prior to becoming a wholly owned subsidiary of Harris, L3 will get to appoint six members of the combined entity's board, the other six being appointed by Harris.[8] Given that the merged entity's business plan and budget will be decided on by its board, with this possibility to appoint board members, the pre-Transaction L3 will have influence over the merged entity[9] for the period of the mandate of the merged entity's first board. .

(10) As all members of the combined entity's board are elected at each annual meeting for terms expiring at the following annual meeting,[10] this influence will not last for more than a year. After the first year, sharholders will control the combined entity and L3 will be under the control of the combined entity as the latter's subsidiary. Thus the current L3 will not influence the merged entity on a lasting basis as required by Article 3 (1) of the Merger Regulation.

(11) Furthermore, as from the first annual meeting following the completion of the Transaction the shareholders that will control the combined entity will be the current Harris shareholders. This is because the pre-completion Harris's shareholders will own approximately 54% of the combined entity[11] and will thus be able to decide on all matters falling within the responsibilities of the shareholders' meeting. This includes electing the board members of the combined entity, as the latter are elected with a simple majority of shareholder votes.[12] Given that, as discussed above, control of the board implies the ability to decide on the business plan, budget and the business policy of the combined

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6 Form CO paragraph 2

7 Consolidated Jurisdictional Notice, paragraph 67.

8 Amended and restated future Certificate of Incorporation of the combined entity. Form CO, Confidential Annex RFI1-3, pages 2 and 4

9 Amended and restated future Certificate of Incorporation of the combined entity. Form CO, Confidential Annex RFI1-3, page 2.

10 Amended and restated future Certificate of Incorporation of the combined entity. Form CO, Confidential Annex RFI1-3, pages 2 and 4.

11 Form CO, paragraph 90

12 Form CO, paragraph 90

entity, the current Harris shareholders will control the combined entity as from the first annual meeting following the completion of the Transaction.

(12) In addition, the current Harris CEO will serve as the chief executive officer of the combined entity as well as the executive chairman of the board for period of two and three years after closing respectively.[13] He can only be removed with a supermajority vote of the board members (75% majority).[14] This also implies that, in the first year following completion (when half of the board members are appointed by the current L3) the current CEO of Harris cannot be removed from the position of CEO of the merged entity without the consent of the board members appointed by Harris.

(13) Thus, it appears that beyond the first year after the completion of the Transaction, Harris will have sole control over L3 and the current Harris shareholders will have control over the combined entity.

(14) The Commission notes that the current L3 CEO will serve as the vice chairman of the combined entity's board for a period of three years, subject to a veto by the board taken by a supermajority (75%) vote.[15] However, this rule does not affect the control of L3 by Harris as the situation remains that, as discussed above, beyond the first year following the completion of the Transaction, L3 will be a subsidiary of Harris with no control over the board (it will appoint only one member, the vice chairman, out of the twelve) and thus the combined entity. It also does not affect the fact that, as discussed above, the current Harris shareholders will control the combined entity's board and thus the combined entity as from the first shareholder meeting after completion, which will take place one year after completion.

(15) Finally, a supermajority (75%) of board member votes is necessary for the appointment of the president and the COO of the combined entity in the first three years following the closing of the merger.[16] These rules also do not change the fact that, following the first year after completion, Harris will control L3 and the current Harris shareholders will control the combined entity.

(16) It follows from the above that the Transaction will lead to a lasting change of control through the acquisition by Harris of sole control over L3 within the meaning of Article 3(1)(b) of the Merger Regulation.

3. EU DIMENSION

(17) The undertakings concerned have a combined aggregate world-wide turnover of more than EUR 5 000 million.[17] (Harris: EUR 5 185 million; L3: EUR 8 491 million.)[18] Each of them has an EU-wide turnover in excess of EUR 250 million

13 Form CO, paragraph 93

14 Form CO, paragraph 93

15 Form CO, paragraph 93

16 Form CO, paragraph 97

17 Turnover calculated in accordance with Article 5(1) of the Merger Regulation and the Commission Consolidated Jurisdictional Notice (OJ C95, 16.4.2008, p. 1).

18 Form CO, paragraph 113, table 11

(Harris: EUR […] million; L3: EUR […] million),[19] but neither of them achieve more than two-thirds of its aggregate EU-wide turnover within one and the same Member State.[20] The notified operation therefore has an EU dimension.

(18) In the turnover calculation, Harris' sales to EU customers through the Foreign Military Sales ('FMS') program of the US government have been allocated to Harris' EEA turnover.

(19) By way of background, the FMS program is the US government's program for exporting defence articles and services to foreign countries and international organizations.[21] Eligible partners, which are designated by the US President and currently include approximately 179 foreign countries and international organizations, either purchase in-stock surplus defence articles directly from the US government or mandate the US Defense Security Cooperation Agency ('DSCA') to procure supplies on a non-profit basis on their behalf.

(20) The purchases by the US Government through the FMS program (on behalf of the eligible partners) are generally subject to competitive tender procedures. Specifically the purchases are governed by the governed by the Federal Acquisition Regulation (FAR) and the Defense Federal Acquisition Regulation Supplement (DFARS).[22] These regulations bind the bind the US government to "*promote and provide for full and open competition in soliciting offers and awarding Government contracts*"[23] Competitive procedures include sealed bids, competitive proposals, combinations of competitive procedures like two-step bidding, and others.

(21) There are two exceptions to this general rule. The first exception allows the US government to exclude one or more suppliers from the competitive process in the interest of increasing or maintaining competition, national defence, or security of supply. The second exception allows the US government to negotiate (i.e. without a tender) with a single supplier specified at the outset by the foreign country or international organization. The latter is known as the sole source exception.

(22) [Proportion] of Harris's FMS sales to the EEA take place under the sole-source exception.[24] In such cases the non-US, i.e. in this case EU, customer selects Harris (mostly, though not always, through a tender) and then mandates the US government, more precisely the DCSA, to procure the goods on its behalf.

(23) According to the Consolidated Jurisdictional Notice, the main rule of geographic revenue allocation is that revenue should be allocated to the country where the customer is located, the underlying principle being that turnover should be allocated to the country where competition with alternative suppliers takes place. This location is normally also the place where the characteristic action

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19 Form CO, paragraph 113, table 11

20 Form CO, paragraph 113, table 11

21 An overview of the FMS program is available at https://www.dsca mil/foreign-customer-guide/security-cooperation-overview

22 See https://www.dsca mil/foreign-customer-guide/security-cooperation-overview

23 FAR, paragraph 6.101(a), available at https://www.acquisition.gov/far/html/Subpart%206_1 html.

24 Form CO, paragraph 111

under the contract in question is to be performed, i.e. where the service is actually provided and the product is actually delivered.[25]

(24) It is clear from the above description that especially in the case of sales to EU customers under the sole source exemption the customer is located in the EU, the goods are delivered to the EU and the competition with other suppliers takes place in the context of a tender run by an EU customer, typically a government or a defence contractor. Thus Harris's sales under the sole source exemption should properly be allocated to the EU, even if the ultimate direct purchaser is the US government that acts on behalf on the EU customer. Allocating turnover this way results in a turnover in excess of EUR 250 million for Harris.

(25) The Commission notes that L3's sales in the EU exceed EUR 250 million even outside the context of the FMS program.

4. OTHER MERGER REVIEW PROCEDURES AND THE SALE OF HARRIS' NIGHT VISION BUSINESS

(26) The Transaction is subject to mandatory merger control notifications in Canada, Turkey and the US.[26] In the context of the US procedure, Harris has offered the sale of its night vision devices business as a remedy to address competition concerns identified by the US Department of Justice ('DoJ').

(27) At the time of the notification to the Commission, the Notifying Party had already noted in the Form CO that Harris' night vision devices business will be divested.[27] Moreover, on 4 April 2019, that is several weeks before the formal notification to the Commission, Harris signed an asset purchase agreement with Elbit Systems of America, LLC, the US subsidiary of Elbit Systems Ltd. ("Elbit")[28] pursuant to which Elbit will acquire the divested business. The acquisition of Harris' night vision devices business by Elbit has not been implemented. Headquartered in Haifa, Israel, Elbit Systems is a global technology and defence company that also has operations in the EU. In 2018, Elbit generated EUR 2.9 billion in revenues, and employed approximately 12,800 people worldwide.[29]

(28) The DoJ's assessment is without prejudice to the Commission's assessment. As the divestment of Harris's night vision business has not yet been implemented, the Commission has to carry out its assessment on the basis that it is part of Harris. Further, even if the same concerns are identified by the Commission and the same commitments (i.e. the divestment of Harris's night vision business) fully address these concerns, the Commission has to assess independently whether or not Elbit will be a suitable purchaser. That is to say, should the Commission deem the divestment both necessary and sufficient to address a competition concern pursuant to its own assessment of the Transaction, the sale to Elbit would be conditional on the acceptance of Elbit by the Commission.

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25 Consolidated Jurisdictional Notice, paragraph 196

26 Form CO, paragraph 88

27 See for example, Form CO, paragraph 9

28 Form RM, footnote 3

29 Form CO, paragraph 253

5. RELEVANT MARKETS AND COMPETITIVE ASSESSMENT

(29) The Parties' activities in the EEA overlap in the following business segments: i) night vision devices ('NVDs'), ii) image intensification tubes ('I2Ts') and iii) hand held video data links ('HH-VDLs').

(30) As regards NVDs sales, all but two of Harris's night vision device product series are solely based on Generation III image intensification technology. The remaining two are fusion NVDs which Harris previously offered in partnership with [partner company] and today offers in partnership with [partner company]. Harris is not active in the supply of thermal NVDs.[30] L3 designs, produces, and supplies a range of NVDs based on Generation III image intensification technology, thermal imaging technology, and fusion technology.[31]

(31) Both Harris and L3 produce and sell Generation III I2Ts. In addition, Harris is currently working on [description of R&D efforts].[32]

(32) Finally, as regards sales of HH-VDLs, Harris's EEA portfolio consists of one device (RF-7800T).[33] L3 supplies a number of HH-VDLs devices under its Rover brand.[34]

(33) The Commission will assess whether the Transaction could potentially give rise to horizontal non-coordinated effects in these segments. The Commission will also analyse whether the Transaction could lead to horizontal coordinated effects in any of the overlap areas.

(34) Given that I2Ts and certain NVDs are in an upstream-downstream relationship, and due to the complementarity of the product portfolios in the broader military communications space, the Commission will also assess whether the Transaction would raise vertical or conglomerate concerns.

5.1. Night vision devices (NVDs)

5.1.1. Market definition

5.1.1.1. Product market definition

A) Introduction

(35) NVDs are opto-electric devices that provide users with improved vision in low-light environments and total darkness. The most common application is night vision goggles used by military personne in night missions, but a rifle's telescopic sight can also be augmented with a night vision device (weapon mounted NVDs).

(36) NVDs can be categorised in several ways:[35]

[30] Form CO, paragraph 136.
[31] Form CO, paragraph 139.
[32] Form CO, paragraph 120.
[33] Form CO, paragraph 275.
[34] Form CO, paragraph 279.

i. *Underlying technology*. NVDs can use image intensification technology (image intensification NVDs), thermal technology (thermal NVDs), or a mixture of both technologies (fusion NVDs). In addition, an emerging technology in night vision is digital low light sensor technology.

   i. Within image intensification NVDs, a further potential distinction can be based on *technology generations*, which correspond to technological improvements. Devices currently produced and sold fall into Generations I-III, with Generation IV being in advanced stages of development.

   ii. Within fusion NVDs a further potential distinction is whether the device uses *optical or digital* image integration.

ii. *Device type*. Regardless of the underlying technology, NVDs can be weapon sight (used on weapons) or goggles (used by troops as eyewear). In addition, there are other types of devices, which include thermal NVDs in the form of portable cameras that work as target detectors and locators; NVDs for tank and armoured vehicle periscopes and vehicle mounted cameras. Goggles can be further classified as follows:

   i. *Mount type:* goggles can be hand held, helmet mounted, head-strap mounted and even weapon mounted

   ii. *Device shape*: goggles can be monoculars, bi-ocular monoculars, binoculars and panoramic.

(37) A brief description of the main NVD technologies (i.e. image intensification, thermal and fusion as well as the different technology generations within image intensification NVDs) is provided in the following paragraphs.

(38) Image intensification technology works by amplifying visible ambient light like starlight and near-infrared light with the help of I2Ts. I2Ts convert ambient photons that hit a light-sensitive photocathode into electrons, then multiply these electrons as they travel through a microchannel plate. The latter is a thin glass disc with millions of small channels each of which releases several electrons for every electron that strikes its inner wall. The multiplied electrons are converted back into photons to render an intensified image on a phosphor screen. Image intensification NVDs thus work with visible and near-infrared light.[36]

(39) By contrast, thermal NVDs work with invisible mid-infrared and far-infrared waves. Thermal NVDs use the temperature of objects to render visible the infrared waves they emit. Infrared detectors capture infrared waves and pass them on to processors that produce and digitally display detailed temperature patterns known as thermograms.[37]

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35 The classification here is slightly modified compared to the version presented by the Notifying Party in Form CO, Section 6-8, Chapter A, section III. The changes take into account the results of the market investigation

36 Form CO, paragraph 157

37 Form CO, paragraphs 166 and 168

(40) Both technologies have their advantages and disadvantages.[38] The advantages of Thermal NVDs compared to image intensification NVDs are as follows: they work in complete absence of light solely based on the heat signature of persons and animals; they are able to highlight persons through camouflage and light foliage, fog, or smoke; and they are more suited to certain covert operations because they need not send any signal towards their target. On the other hand thermal NVDs have several drawbacks compared to image intensification NVDs: as they pick up only heat, they are less suited to identify details in the image; they cannot look through glass; they do not work with illumination tools like beacons, strobes and lasers; they are larger and heavier; they consume more power; they are more difficult to maintain; and their use requires more training.

(41) Fusion devices combine image intensification technology and thermal imaging technology.[39] By merging the outputs from I2Ts and the thermal images they provide the user with a single integrated image. The integration can happen through optical and digital means, as discussed above. Fusion NVDs take advantage of the strengths of each type of technology: the I2Ts provide an image of the surrounding environment under low-light conditions, while the thermal imaging sensors allow for the detection of objects and targets of interest by superimposing thermal signatures of the objects in the environment. Although fusion devices unite the advantages of both technologies, this comes at the cost of being larger and heavier than non-fusion devices. Naturally, combining two different technologies increases the cost of the device.

(42) As discussed above within image intensification NVDs, a further potential segmentation based on technology generations is based on the technology generation of the most critical component, i.e. the I2T. The US military classifies commercially available I2Ts into three different generations, i.e. Generations I-III[40] Generation IV is not yet available on the market and there are ongoing R&D efforts to create it. Broadly speaking, each generation marks a significant development step in tube technology and each generation corresponds to minimum performance criteria relating to range of vision, resolution, signal-to-noise ratio, useful life, or the amount of light it the device requires to function (the lower the better as a new generation device is expected to provide vision in circumstances approaching total darkness). For example, a generation III device has a range of 270 meters, provides clean and bright images, works in near-absolute darkness and has a useful life of at least 10 000 hours.

B) Notifying Party's view

(43) The Notifying Party considers that the relevant product market should comprise NVDs as a whole and should not be further segmented according to the any of the above criteria.

(44) The Notifying Party submits that customers view all NVDs as interchangeable since they all have the same basic function, i.e., providing improved vision.[41]

38 Form CO, paragraphs 169 and 170
39 Form CO, paragraphs 171 and 173
40 Form CO, paragraph 159 and table 15
41 Form CO, paragraphs 187 and 195

Thus the Notifying Party considers that all NVDs are substitutable from a demand perspective regardless of technology, technology generation, device type, mount type or device shape. Further, when it comes to mounting options, the Notifying Party notes that most NVDs allow for different mounting options.[42]

(45) The Notifying Party further submits that the technologies to manufacture different NVDs are similar, which results in supply-side substitutability.[43] More specifically, the Notifying Party submits that switching production from one device type to another (e.g. from weapon sight to goggles or vice-versa) or from one technology to another (e.g. from image intensification to thermal technology or vice versa) is possible in the ordinary course of business.[44] Moreover, if a supplier does not have a specific technology type (e.g. has image intensification technology but does not have thermal technology) it can still compete for fusion opportunities by sourcing the missing technology from thurd party providers. For example, Harris sources thermal technology from [supply sources] when it competes for fusion opportunities.[45] With regard to NVDs of different shapes, the Notifying Party argues that supply-side substitutability is supported by the fact that most device manufacturers can and do supply all different NVD shapes and that the chassis and optical setup of NVDs account for a fraction of device cost, which is rather driven by the technology (image intensification, thermal or both).[46] In relation to different mounting options, the Notifying Party points out that most suppliers offer multiple mounting options for their NVDs, which makes a supply-side distinction unnecessary.[47]

C) Commission's decisional practice

(46) In past cases involving NVDs, the Commission has so far left open the precise product market definition.

(47) In *Safran/Zodiac* and *Daimler Benz/Carl Zeiss*, the Commission considered that NVDs fall within the category of defence optronics.[48] Defense optronics includes (i) thermal imaging units, (ii) residual light amplification units, (iii) visors mounted on land vehicles, ships, aircraft, or submarines, (iv) laser range finders, (v) units for missile guidance systems, (vi) optronic sensors for reconnaissance, (vii) navigation and weapon guidance, and (viii) optronic warning sensors.[49] In this classification "thermal imaging units" correspond to thermal NVDs, and "residual light amplification units" correspond to image intensification NVDs.

(48) With regard to further possible segmentation of the category of defence optronics, the Commission noted that technologies used to manufacture various types of optronics equipment are similar but that the supply and demand landscapes are

42 Form CO, paragraph 197
43 Form CO, paragraph 187
44 Form CO, paragraph 189
45 Form CO, paragraph 190
46 Form CO, paragraph 196
47 Form CO, paragraph 197
48 Case COMP/M.8425 Safran/Zodiac, recitals 255 and 257; Case IV/M.598 Daimler Benz/Carl Zeiss, recitals 8-9
49 Safran/Zodiac, recital 253

not necessarily the same for all products.[50] Ultimately, the Commission left the question of finding separate markets within defence optronics open.

D) Commission's assessment

(49) The Commission will assess demand-side substitution first, followed by supply-side substitution.

(a) Demand substitution

(50) As a preliminary remark, the responses received in reply to the Commission's market investigation show a consistent view regarding possible market segmantations. Namely, it appears that there is no demand-side substitution across the distinctions mentioned in Section 7.1.1.1, except for mounting type within goggles (as many goggles are sold with helmet or head-strap mounting options and can also be used in hand) and possibly for digital and optical integration within fusion devices. This is because different NVDs have different characteristics or performance parameters, which result in different intended uses and different prices. Further, customers always appear to specify in detail the NVDs they require (e.g. NVD of a certain technology, of a certain technology generation or equivalent performance metrics, of a certain type, shape), which implies that only NVDs complying with those specifications are compliant offers and thus NVDs with different specifications are not substitutable from a demand perspective. In other words, as is typical in bidding markets for specialized goods, the tenders (i.e. the demand side) are highly specific, i.e. often different from one tender to another and not broad enough to include different versions of the same basic product. As a result, from a demand perspective tenders often result in separate markets and the market definition tends to turn on supply-side substitution: if suppliers can easily adjust their production to meet the tender specifications, the types of devices corresponding to such specifications will belong to the same market; if they cannot, the devices will belong to separate markets.

(51) The detailed evidence relating to demand-substitution across different distinctions is presented below in respect of each distinction.

a.i) Distinction based on technology – main technologies

(52) The Commission will discuss first the demand substitutability of the main night vision technologies (image intensification, thermal and fusion).

(53) With regard to the question whether NVDs of different technology types (thermal, image intensification, fusion) can be used interchangeably, a majority of customers[51] considered that this is not the case.[52]. For example, Promoteq AB

50 Safran/Zodiac, recitals 255-257

51 When discussing the results of the Commission's market investigation, unless otherwise specified in this decision the term "majority" or "minority" is based on a count that excludes respondents who replied "I do not know". E.g. in the case of a yes/no question, if 10 respondents answered "yes", 6 respondents answered "no" and 6 respondents replied "I do not know", there is a majority of "yes" answers.

52 Q1 Questionnaire to customers, question 4

submitted that "*the Technologies provide different capabilities and functionality.*"[53] A large majority of customers confirmed that they or, as the case may be, the final customer (i.e. defence departments) specify in the tender the type of technology requested.[54]

(54) Customers unanimously agreed that there are significant advantages or disadvantages associated with each technology such that the different technologies are used for different missions or by different users (e.g. special forces, standard infantry, helicopter pilots, non-military users etc.).[55] Respondents pointed out that pilots can use only image intensification NVDs as thermal devices do not look through cockpits or windshields; that thermal technology has low battery life (2-3 hours) compared to image intensification NVDs; that fusion devices bring the most advantages but they are bigger, heavier and need more power than non-fusion devices; that thermal NVDs are not limited by the amount of light available whereas image intensification NVDs are; and that, contrary to thermal NVDs, image intensification NVDs allow for the identification of people, the reading of maps due to the better quality image they provide.[56] The explanations also highlight that the different technologies are used for different purposes. For example, Australia's Department of Defence considered that "*Some NVD technologies are reliant on large power and ancillary systems which are not suitable for dismounted (non-vehicular) operations. Similarly, equipment in some vehicles (notably aircraft) requires higher levels of technical performance. Hence, different technologies may be used depending on the role or nature of use*."[57] Tecnex OY submitted that "*Use cases and costs differ currently.*"[58]

(55) Competitors' responses were fully in line with those of customers. All competitors confirmed that the customers do not consider image intensification, thermal and fusion NVDs interchangeable.[59] Thales observed in this regard that "*Those devices integrate different types of technologies, and each technology corresponds to different mission-system scenarios. Each of these technologies therefore implies different performances, and different prices*"."[60] and that "*Customers are knowledgeable to select the technology matching best their key criteria for the operational mission and express explicitly their technology requirements in their RFI/RFQ*"[61]. Elbit submitted that "*No, the technologies are very different and therefore also the uses. Each technology has it own pros and cons. The customer will choose the product according to the mission he needs to complete"*[62], while United Technologies Corporation stated that "*products have different tasks and purposes and are not interchangeable....For example, you would use different products depending on the environment, mission, time of day,*

53 Promoteq AB's response to Q1 Questionnaire to customers, question 4
54 Q1 Questionnaire to customers, question 5
55 Q1 Questionnaire to customers, question 5
56 Q1 Questionnaire to customers, question 5
57 Response of the Commonwealth of Australia Department of Defence to Q1 Questionnaire to customers, question 6
58 Tecnex OY's response to Q1 Questionnaire to customers, question 6
59 Q2 Questionnaire to competitors, question 4
60 Thales's response to Q1 Questionnaire to customers, question 4
61 Thales's response to Q1 Questionnaire to customers, question 7
62 Elbit's response to Q2 Questionnaire to competitors, question 4

etc."[63] The large majority of competitors confirmed that customers specify in their tenders the technology requested.[64] Competitors also unanimously agreed with the statement that there are significant advantages or disadvantages associated with each technology such that the different technologies are used for different missions or by different users.[65] For example, PCO submitted that "*there are significant advantages and disadvantages associated with each technology, depending on the situation and mission to be accomplished"*[66]

(56) In summary, the market investigation confirmed that the different technologies cannot be used interchangeably; that customers specify in their tender the technology they request, and that each technology presents advantages and disadvantages and that, as a result, NVDs of different technologies are used for different missions and tasks.

(57) These results exclude the possibility of demand side substitution across different technologies. Already the fact that customers specify in their tenders the technology requested rules out the possibility that NVDs of different technologies are demand-substitutable. If the tenders specify the type of technology (e.g. image intensification NVD), then there is distinct customer demand for a specific technology and suppliers cannot successfully offer an NVD based on a different technology as such a bid would be non-compliant. Likewise, the confirmed advantages and disadvantages of the different technologies are also incompatible with demand-side substitution. If the customer seeks NVDs for missions where there could be no external light or where it is important to see targets behind objects, image intensification NVDs are not an option. Likewise, thermal NVDs are not an option for drivers and pilots or for missions where a long battery time is needed or where the small size of the device is essential. While fusion devices can, in principle, be used instead of both thermal and image intensification NVDs, they are heavier, consume more power and more expensive than image intensification NVDs and thus will not be used in missions where long usage time and small size is essential or requested in tenders with budget constraints.

A.ii) Distinction based on technology – digital low light sensor technology

(58) A significant number of customers and competitors indicated that currently NVDs using digital technology do not match the performance of image intensification NVDs and thus cannot be considered as substitutes.[67] For example, L.F.E. SAS stated that "*The digital hasn't reached the level of resolution*"[68] while Safran considered that "*We do not believe it is likely that I2T technology will be replaced in the near term*."[69] Thales submitted that "*Low light sensor technology is not able to meet today I2T performance in low dark, therefore it cannot be a substitute to I2T technology*."[70] Similarly, Italy's Land Armament Directorate

63 Response of United Technologies Corporation to Q2 Questionnaire to competitors, question 4
64 Q2 Questionnaire to competitors, question 5
65 Q2 Questionnaire to competitors, question 6
66 PCO's response to Q2 Questionnaire to competitors, question 6
67 Q1 Questionnaire to customers, questions 10 and 11, Q2 Questionnaire to competitors, questions 15 and 16
68 L.F.E. SAS's response to Q1 Questionnaire to customers, question 10
69 Safran's response to Q1 Questionnaire to customers, question 10
70 Thales's response to Q1 Questionnaire to customers, question 10

considered that "*NVDs based on digital low-light sensor technology are suitable just for moonlight condition"*[71] i.e. they are not suitable for lower light environments, such as starlight, in which image intensification NVDs have been known to operate. Elbit noted that "*The low light technology at the present can't compete with the I2T*."[72]

(59) It follows that digital low light sensor technology is not demand-substitutable with image intensification (and thus fusion) technology. As the main shortcoming of digital low light technology relative to image intensification technology is that it does not perform well in lower light environments, the same problem would be even more present relative thermal technology, as one important characteristic of the latter is that it operates in conditions of total darkness. Thus digital low light technology is not substitutable with thermal technology either.

a.iii) Distinction based on technology generations (only image intensification NVDs)

(60) The majority of customers and competitors confirmed that within image intensification NVDs, NVDs of different technology generations are not perceived by customers as interchangeable.[73] For example, Safran noted that "*The varying generations of I2Ts offer increasing levels of performance. Moreover, customers usually have specific requirements in terms of technology regarding I2Ts. Therefore they are not « interchangeable » amongst different generations."*[74] The technology generations are based on specific technical criteria, like range, battery lifetime, figure of merit (FOM, i.e. Resolution x signal-to-noise ratio) etc. Indeed, NVDs of substantially different performance levels cannot be used interchangeably: if the mission requires high or the highest available performance level, the newest generation device will be sought. Conversely, if for a given mission lower performance level is acceptable or there are budget constraints (older generation products are priced lower than newer generation products) an earlier generation NVD will be requested. An NVD not meeting the performance criteria, or a costlier NVD with much higher performance metrics than requested will not be accepted.

(61) In line with this, both customers and competitors confirm that customers specify the relevant technology generation in their tenders or, failing that, the required performance levels that the device has to comply with, which leads to the same result.[75] As discussed before this in itself rules out demand-substitution across generations: if a certain generation or the equivalent performance level is defined in a tender, only devices of the relevant generation will be accepted as older generation devices will not meet the criteria, while newer generation (more performant) devices will be disqualified on price or at least will not be price competitive.

(62) Thus the Commission considers that there is no demand substitutability between image intensification NVDs of different generations

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71 Response of Italy's Land Armament Directorate to Q1 Questionnaire to customers, question 11

72 Elbit's response to Q2 Questionnaire to competitors, question 16

73 Q1 Questionnaire to customers, question 8, Q2 Questionnaire to competitors, question 11

74 Safran's response to Q1 Questionnaire to customers, question 8.

75 Q1 Questionnaire to customers, question 9, Q2 Questionnaire to competitors, question 12

a.iv) Distinction based on integration technology within fusion devices

(63) A fusion NVD integrates the image from an I2T (as in an image intensification NVD) and thermal sensors (as in thermal devices) into one composite, or fused, image. The method to integrate the images can be digital or optical, which raises the question of two distinct product markets within fusion devices based on integration technology.

(64) Market feedback in this respect was mixed. While a slight majority of customers considered that fusion devices with different integration technologies cannot be used interchangeably, competitors had the opposite view. [76]

(65) Certain respondents pointed out that fusion NVDs with digital integration perform better but are more expensive, consume more power and heavier (as it needs larger batteries) than fusion NVDs using optical integration. By contrast fusion NVDs using optical integration are less performant but are lighter, more easily portable and less expensive.[77] The Night Vision Technologies Handbook of the US Department of Homeland Security mentions the same trade-off between the two devices.[78] However, it is unclear whether such differences result in the lack of substitutability from a demand perspective.

(66) A majority of respondents (majority of customers and half of competitors) considered that customers do not specify the integration technology when procuring fusion NVDs suggesting that there is no separate demand for fusion devices with a particular integration technology.[79] Instead, separate demand can potentially manifest itself indirectly, through the performance parameters that customers specify in their tenders. However, there is no clear indication in the market investigation whether the required parameters for fusion devices are such that only devices with one type of integration technology can comply with them.

(67) Consequently, the Commission leaves the question of demand substitutability open as it does not influence the competitive assessment.

a.v) Distinction based on device type

(68) As a preliminary remark, the Commission notes that the terminology with regard to device type and mounting options is not entirely consistent between the Form CO and the respondents of the market investigation. The Form CO uses the term "device type" to distinguish between weapon sights and goggles, and the term "mounting type" to distinguish between hand-held, helmet and head-strap mounted NVDs. However, when respondents discuss mounting options they often include weapon mounted NVDs, which can correspond to weapon sights. Further, respondents also mention (thermal) cameras that work as target detectors and locators, which are distinct from hand held goggle NVDs used by military

76 Q1 Questionnaire to customers, question 13, Q2 Questionnaire to competitors, questions 19 and 20.

77 See the responses of L.F.E to Q1 Questionnaire to customers, questions 13 and question 14, Theon's response to Q1 Questionnaire to customers, question 14, Thales's and United Technologies Corporation's response to Q2 Questionnaire to competitors, question 20.

78 https://www.dhs.gov/sites/default/files/publications/NV-Tech-HB_1013-508.pdf page 11

79 Q1 Questionnaire to customers, question 15, Q2 Questionnaire to competitors, question 21

personnel. In addition, some NVD goggles can be mounted on helmet, head-straps and even weapons.[80]

(69) The responses of the market investigation thus need to be interpreted carefully. For the purposes of this decision, the Commission will use these concepts the following way. By "*device type*", the Commission refers to the following categories of devices:

i. "*weapon sight NVDs*" – these are NVDs specifically designed for weapons. For example the L3's AN/PVS-24 CNVD is "*part of the USSOCOM SOPMOD system for M4 Carbine*.[81] Likewise L3's CNVD-LR is also designed specifically as a weapon sight.[82] Weapon sight NVDs in this sense excludes googles that have several mounting options one of which may include weapon mounting.

ii. "*Goggles*" are eyewear NVDs worn by military personnel. Most often they are helmet mounted or head-strap mounted. Some models can even be weapon mounted, without having been specifically designed as a weapon sight. For example, Harris's F6015 model can be hand held, helmet mounted, head-strap mounted but can also be weapon mounted as a night scope.[83]

iii. There are other types of devices, which include thermal NVDs in the form of *portable cameras* that work as target detectors and locators; *NVDs for tank and armoured vehicle periscopes*; *vehicle mounted cameras*; *NVDs mounted on aircraft* and *stationiary NVDs*. These types are less relevant to the assessment as either one of the Parties or both Parties are inactive in these segments.

(70) By contrast, when the Commission uses the term "*mounting option*" it only refers to the different mounting option of *NVD goggles*. This excludes weapon sights, as indicated above, but includes goggles that come with multiple mounting options, one of which can be weapon mounting.

(71) The Commission follows this terminology because it is useful to distinguish the different mounting options within goggles from weapon sights, portable cameras and vehicle mounted cameras even if the terms "portable" and "vehicle mounted" could be also be viewed as mounting options in the broader sense. This is because in the case of mounting options within goggles demand substitution does not even arise as the device itself can be used in different ways, while, as discussed below, the difference appears to be substantial across goggles, weapon sights specifically designed as such, portable cameras, vehicle mounted cameras, NVDs used as periscopes etc.

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80 https://www harris.com/sites/default/files/downloads/solutions/f6015-gen3-monocular-night-vision-anpvs-14.pdf

81 https://tnvc.com/shop/l3-anpvs-24-cnvd/

82 https://tnvc.com/shop/cnvd-lr/

83 https://www harris.com/sites/default/files/downloads/solutions/f6015-gen3-monocular-night-vision-anpvs-14.pdf

(72) A majority of both customers and competitors confirmed that weapon sight NVDs and goggles cannot be used interchangeably.[84] Indeed, as both types were developed so as to be optimally used on weapons or to be carried by troops, they cannot be used interchangeably, save for in an emergency situation as a makeshift solution. Elbit noted that the uses are very different, that weapon sights are more rigid and heavier than goggles that they require more energy and that the customer requests different features for weapon sights.[85] United Technologies Corporation submitted that "*The devices are not interchangeable and have different functions*."[86] The Ministry of Defence of Lithuania considered that weapon sight and google NVDs "[serve] *different purposes and different tactical capabilities"*[87]

(73) In this case too, a majority of customers and all competitors confirmed that tenders specify the device type (weapon sight or goggle) sought,[88] which, as discussed before, rules out demand-side substitution in itself.

(74) Portable cameras that work as target detectors and locators also appear to be different from weapon sights and goggles. As Thales noted "*In Thales' opinion, there are different types of NVDs according to:1. Soldier Night Vision Goggles: portable, linked to the helmet on the soldier's head for the soldier's mobility. 2. Hand-Held Camera: portable, more weight, for target locator. 3. Weapon sights using Night Vision for aiming. Each of these devices are different end products, with different capacities and performances according to their contribution to the mission. Inside Soldier NVG* [Night Vision Goggles], *we can consider the different mountings as interchangeable according to the customer's requirements*."[89] Theon also considered that portable cameras are used for long range observation purposes and they are different from night vision goggles.[90] Indeed, Thales's product "*Sophie hand held thermal imagers*"[91] is a thermal NVD used for day/night observation and accurate target location, which is different from goggles worn by combat troops. The same applies to Theon's DIKTIS-TL[92] These devices are predominantly thermal NVDs. Unlike goggles worn by combat troops, these devices are used in more static situations (i.e. for observation). Thales's response also confirms that the different mounting options within goggle NVDs should not be distinguished.

(75) The Commission also considers that NVDs for tank periscopes, vehicle mounted NVDs, such as Theon's Urania,[93] NVDs mounted on aircraft and stationiary NVDs are different from the NVD types discussed before as well as from each other. An NVD designed to be used on a tank periscope or to be carried by an armoured vehicle or an aircraft clearly cannot be used the same way as weapon

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84 Q1 Questionnaire to customers, question 16, Q2 Questionnaire to competitors, question 23

85 Elbit's response to Q2 Questionnaire to competitors, question 23

86 Response of United Technologies Corporation to Q2 Questionnaire to competitors, question 23

87 Response of The Ministry of Defence of Lithuania to Q

88 Q1 Questionnaire to customers, question 17, Q2 Questionnaire to competitors, question 23

89 Thales's response to Q1 Questionnaire to customers, question 19

90 Theon's response to Q1 Questionnaire to customers, question 18

91 https://www.thalesgroup.com/en/global/activities/defence/land-forces/soldier-optronics#handheldthermalimagers

92 https://www.theon.com/diktis

93 https://www.theon.com/urania

sight or a goggle mounted on the helmet or the head-strap of a military personnel or held by the latter in his hand.

(76) Consequently, the Commission considers that there is no demand substitutability across different device types

a.vi) Distinction based on mounting options

(77) As discussed before in Section 5.1.1.1.D.av.), mounting option only refers to the different mounting possibilities within the goggle type NVDs. As such goggles usually come with multiple mounting options, demand substitutability does not even arise as the device itself can be used differently.

(78) The Commission therefore considers that within goggles it is not appropriate to distinguish mounting options from a demand perspective.

a.vii) Distinction based on device shape

(79) As indicated before in Section 5.1.1.1.D.av.), the different device shapes (monoculars, bi-ocular monoculars, binoculars and panoramic) are assessed only within the goggle device type. Other device types usually have a characteristic shape (e.g. weapon sights are typically monoculars, tank periscopes have a particular design) or not produced in different shapes (portable cameras for observation or vehicle mounted NVDs).

(80) The different shapes have different advantages and disadvantages. Monoculars and bi-ocular monoculars are generally smaller and lighter than binoculars of similar optical properties and panoramic NVDs, which makes monoculars easier to carry. Binoculars and panoramic NVDs have the advantage of improved depth perception at the expense of larger size, weight, and higher power consumption from multiple I2Ts.[94]

(81) These trade-offs imply that the different shapes are used by different users and for different missions. As Griffity Defense Gmbh noted "*For safe driving of vehicles and for flying a double-eyed night vision goggles is necessary. For safe movement in the field and possibly for shooting, a night vision goggles in which one side can be folded up*."[95] Accordingly, depth perception is important for driving and flying and thus monoculars and bi-ocular monoculars will not be used for such purpose. At the same, as the quote indicated, it is not possible to fold one side of a binocular NVD up, whereas such functionality is sometimes required for safe movement and shooting. Panoramic NVDs have been developed to solve the limited field of view offered by monoculars, bi-ocular monoculars and binoculars, which creates a tunnel vision effect. While the latter have a field of view of 45 degrees, panoramic NVDs offer a 97 degree field of view, which is similar to daylight field of vision. At the same time a panoramic device uses 4 I2Ts, increasing very significantly the cost of the device and its power consumption. Having such a wide field of view is important in Closed Quarter Combat missions,[96] i.e. in missions involving engagement with the enemy at very short

94 Form CO, paragraph 195

95 Griffity Defense Gmbh's response to Q1 Questionnaire to customers, question 18

96 http://www.americanspecialops.com/equipment/GPNVG/

range (up to 100 meters) in hand-to-hand combat or using short-range firearms. Thus, for such type of missions panoramic devices will be considered despite the price and battery consumption. The opposite will be the case for missions where a wide field of view is less important than reduced weight and power consumption of the device.

(82) Thus the Commission considers that there is no demand side substitution between NVD googles of different shapes.

a.viii) Conclusion on demand substitutability

(83) Based on the preceding analysis, with the exception of mounting options within the goggle type NVDs and possibly integration technology (digital or optical) in the case of fusion devices, none of the distinctions mentioned are demand substitutable.

(b) Supply side substitution

b.i) Distinction based on technology – main technologies

(84) Competitors were unanimous in their view that switching from the production of NVDs relying on one type of underlying technology to NVDs relying on another underlying technology (e.g. from thermal to image intensification or vice versa) would imply significant technical difficulties and/or costs.

(85) For example, Elbit submitted that "*NVD and thermal are very different technologies; in order to develop thermal devices you need to develop advanced software and develop electronic PCB.* [printed circuit board] *The developing time can reach to several years depending on the credibility of the systems; for military use the required credibility is much higher*."[97] PCO SA considered that "*according to our best knowledge establishing any entity manufacturing each of the mentioned technologies requires investments ca EUR 100M*."[98] United Technologies Corporation also confirmed that the manufacturing processes are different and estimated that switching production would require 24-36 months and millions of dollars for the base technology.[99] In Safran's view the development of any of the technologies requires significant R&D costs and "*huge*" investments.[100]

(86) It is clear from these responses that switching production between image intensification and thermal technologies cannot be done in the short term without incurring significant additional costs or risks, in line with the Commission's Notice on the definition of the relevant market.[101] The Commission therefore considers that there is no supply-side substitution across NVDs with different underlying technologies.

97 Elbit's response to Q2 Questionnaire to competitors, question 9

98 PCO S.A.'s response to Q2 Questionnaire to competitors, question 9

99 Response of United Technologies Corporation to Q2 Questionnaire to competitors, question 9

100 Safran's response to Questionnaire to competitors, question 9

101 Commission Notice on the definition of relevant market for the purposes of Community competition law, OJ

(87) A specific question is whether any image intensification NVD supplier or any thermal NVD supplier can swiftly create a fusion NVD by sourcing the other technology from an alternative provider. The responses in this regard were close to equally split.[102] However, the explanations given do not support supply-side substitutability.

(88) Pointing to the example of Harris, Elbit submitted that it is possible to be competitive in fusion devices by sourcing thermal technology.[103] While this is true, the response did not reveal whether this is possible at short notice and with relative ease, so this response does not support clearly supply-side substitution. The question essentially is whether fusion devices have their own technological challenges or they are very easily put together by combining thermal and image intensification technologies. In this regard Thales considered that "*Teaming between partners of each technology will not provide the fusion capabilities. This capacity needs to be developed on top of each existing technology."*[104] United Technologies Corporation noted that sourcing the missing technology could be easy but this could involve costs.[105] These responses suggest that even through sourcing the missing technology, switching production to fusion technology based devices cannot be done swiftly and without overcoming significant difficulties because fusion devices have their own challenges.

(89) Indeed, as the discussion in Section 5.2.1.4.(B.iv) shows, the market test clearly shows that even changing the integration technology *within* fusion devices (i.e. switching to optical integration from digital or vice-versa) is not possible at short notice and without great difficulties. This strongly suggests that fusion devices have their own technological challenges as suggested by Thales. These include, but are not necessarily limited to, the integration technology and the need to create a new architecture for the device that houses two types of technology.

(90) The Commission adds that the mere fact of sourcing a technology or partnering with another technology provider can, in itself, be an obstacle to exercising competitive pressure at short notice as the partner may not be available, may not have the capacity or may not provide the requested quality at the requested price etc. Not having the technology in-house always creates such risks. This does not mean that a thermal or an image intensification NVD supplier cannot be a competitive constraint in fusion devices at all (clearly Harris can) but it does make it more difficult to become a credible competitive constraint at short notice and at little cost.

(91) Based on the above the Commission considers that it would not be correct to regard image intensification NVD suppliers and thermal suppliers as competitors in fusion NVDs (which would be the case if supply-side substitution is admitted). The competitive reality rather appears to be that these suppliers are well positioned to enter the fusion NVD market if they so decide, i.e. they would be potential rather than actual competitors if they have the intention to compete.

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102 Q2 Questionnaire to competitors, question 10

103 Elbit's response to Q2 Questionnaire to competitors, question 10

104 Thales's response to Q2 Questionnaire to competitors, question 10

105 Response of United Technologies Corporation to Q2 Questionnaire to competitors, question 10

(92) Given the lack of both demand and supply-side substitutability, the Commission considers that NVDs using image intensification, thermal, and fusion technologies belong to separate markets.

b.ii) Distinction based on technology – digital low light sensor technology

(93) Similar to the distinction between the main technologies, a large majority of competitors considered that switching production between digital low light sensor technology and the main technologies implies significant difficulties and costs due to different manufacturing processes and know-how.[106] Thus, the Commission considers that supply side substitution does not apply across NVDs of any technology. Given the lack of demand-side and supply-side substitutability, NVDs using digital low light sensor technology belong to markets separate from thermal, image intensification and fusion NVDs.

b.iii) Distinction based on technology generations – image intensification technology

(94) A majority of competitors considered that switching production between NVDs using different image intensification technology generations would not imply significant technical difficulties or costs.[107]

(95) Each generation represents a significant improvement in I2T technology, which could suggest that supply-side substitution is asymmetric in that producers of the more advanced version of the same technology can constrain producers of earlier versions but this would not be true vice-versa. However, the majority of image intensification suppliers source their I2T from I2T providers and therefore upgrading their devices to a new generation involves only integrating the new I2T in their products, which can be done with relative ease. As Thales noted "*Given each I2T generation implies some R&D and therefore some capacity enhancement, the integrator of the tubes will need to make sure that the rest of the NVDs components are adapted to the new generation. This is only an upgrade of the NVDs and shall not imply significant difficulties."*[108]

(96) In any event, all significant players in image intensification NVD providers (the Parties, Theon, Thales, PCO, Elbit) have generation III device capability and thus could, in any case, easily supply previous generation devices.[109]

(97) Generation IV is not yet on the market and based on the market feedback it is not possible to determine with any certainty when it will be available as a product. "*Generation IV is largely a marketing description*." according to Australia's Department of Defence[110] Similarly, Griffity Defense Gmbh noted that "*There is no Generation IV on the World Market. The aggressive advertisement of company*

106 Q2 Questionnaire to competitors, question 18

107 Q2 Questionnaire to competitors, question 14

108 Thales's response to Q2 Questionnaire to competitors, question 14

109 For the Parties : Form CO paragraphs 177 and 191; for PCO https://www.defence24.com/police-acquires-night-vision-devices-from-pco; for Theon http://www.tacticalstoreusa.com/military-night-vision-gear ; for Thales see for example https://www.thalesgroup.com/sites/default/files/database/d7/asset/document/lucie_a4_en_052016.pdf

110 Response of Australia's Department of Defence to Q1 Questionnaire to customers, question 8

Photonis with tube designation "4G" is nevertheless only an image intensifier of the II generation."[111] Thales considered that "*Harris announced it was supported by the US army to develop a generation 4 of tubes for night goggles. Those new tubes may sustain a lower level of light, which is better. However, the development of this new generation of tubes may be only potential*."[112] Given the uncertainty about the timing and the development of Generation IV technology, there is no reason to distinguish markets based on generation on a forward looking basis either.

(98) Overall therefore, despite the lack of demand-side substitutability, the Commission considers that there are no separate markets within image intensification technology based on technology generations.

b.iv) Distinction based on integration technology within fusion devices

(99) A large majority of competitors considered that the manufacturing process and know-how required for the manufacturing of fusion NVDs relying on different integration technology (optical or digital) are different such that switching from one to another would imply significant technical difficulties and/or costs.[113] Elbit considered that switching from one technology to the other would require significant technical R&D, while Safran noted that the different technologies require different architectures for the NVD.[114]

(100) While there appears to be no supply-side substitution, demand-side substitution was ambiguous. As this distinction has no influence on the competitive assessment, within fusion devices the Commission leaves the market definition based on integration technology open.

b.v) Distinction by device type

(101) The market feedback was mixed on the question whether a supplier that produces a certain type of device can switch production to produce another type of device without incurring significant difficulties and costs.[115] While Thales and Safran considered that the time and cost implications would be significant, PCO S.A. and WB Electronic were of the opposite view.[116] Although United Technologies and Elbit agreed with the proposition that the manufacturing processes are different such that switching implies significant time and cost, their explanations gave a more nuanced view. Elbit mentioned both months and years in terms of the time necessary to switch, while United Technologies mentioned that from a sensor perspective the adjustment would be easy.[117]

(102) The Commission also notes that most major players have in their product portfolio weapon sights and googles, the two most common types of devices

111 The response of Griffity Defense Gmbh to Q1 Questionnaire to customers, question 8
112 Thales's response to Q2 Questionnaire to competitors, question 11
113 Q2 Questionnaire to competitors, question 22
114 Elbit's and Safran's response to Q2 Questionnaire to competitors, question 22
115 Q2 Questionnaire to competitors, question 27
116 Responses of Thales, Safran, PCO SA and WB Electronic to Q2 Questionnaire to competitors, question 27
117 Responses of Elbit and United Technologies

within image intensification NVDs. Likewise, most thermal suppliers produce hand held cameras for observation purposes. The distinction therefore may not make a difference with regard to such device types as all major producers would constrain one another even in the case of narrower markets.

(103) However, the question whether separate markets should be distinguished based on device type could be left open as this would not change the competitive assessment.

b.vi) Distinction by device shape

(104) Switching production from one device shape to another appears to be easier than switching production between device types and thus supply side substitution is likely to apply across device shapes. Indeed, doubling or halving the number of eyepieces or objective lenses requires less effort than switching production to create a different device type. [Description] an internal Harris presentation that discusses the competitive landscape. In this document, Harris notes that [description of fused binocular opportunities in the coming years].[118] The presentation also reveals that Harris notices the express demand for this particular shaped fusion device around April 2018 and that up to that point it only had monocular fusion NVDs but not a binocular product.[119] In respect of this new opportunity, Harris mentions that [internal Assessment][120] The fact that for the next tender a supplier can be competitive in a different device shape strongly suggests supply-side substitution: already in the next opportunity (i.e. in the context of a bidding market, swiftly) a device maker lacking a particular shape can be credible competitive constraint.

(105) The Parties internal documents also indicate that they do not assess competition by device shape. For example an internal Harris SWOT analysis relating to night vision makes no mention of specific competition dynamics related to device shape.[121] Likewise, an April 2018 Harris presentation that discusses, inter alia, the different segments within the night vision business makes no mention of a segment based on device shape.[122]

(106) Moreover, all major NVD suppliers produce the main device shapes (monocular, binocular, or bi-ocular monocular), i.e. they have capabilities to produce all these device shapes. This is true even if, as was the case with Harris in fusion devices, a given supplier's product portfolio does not include all device shapes in every segment discussed so far (i.e. image intensification, thermal, fusion NVDs and all device types within each of these technologies). As a result the supplier base would be the same even in the case of narrower markets, i.e. it would not be the case that in certain device shapes a given supplier would not be a constraint. Further, there is no indication in the market investigation that any supplier would be particularly strong in one shape versus another or that competition would be driven by very different dynamics and parameters depending on different device

118 Form CO Annex RFI1 17, page 29
119 Form CO Annex RFI1 17, page 33
120 Form CO Annex RFI1 17, page 33
121 Annex Form CO 5.4.83
122 Form CO Annex RFI1 17, page 30

shap. Thus the competitive landscape would not necessarily be different if separate markets were defined based on device shapes instead of a unified market.

(107) A potential exception is panoramic devices as not all suppliers produce such devices. However, even in that case it remains true that suppliers can adjust production relatively swiftly and without great difficulties and that suppliers do not seem to assess competition in terms of device shapes.

(108) The Commission therefore considers that supply-side substitution applies across different device shapes and that, as a result, there is no need to distinguish between different markets based on device shape.

E) Conclusion on product market definition

(109) On the basis of the above, the Commission considers that:

i. NVDs based on different technologies (image intensification, thermal, fusion and digital low light sensor technology) belong to separate product markets.

- Within image intensification NVDs, there are no separate markets based on technology generations.

- Within fusion NVDs, the possibility whether fusion devices with optical and digital integration technology belong to separate markets can be left open.

ii. The question whether different device types (goggles, weapon sights, hand held cameras for observation, target location and surveillance, vehicle mounted NVDs, tank periscope devices etc.) belong to separate markets can be left open.

- Within goggles there are no separate markets based on mounting options (helmet mounted, head-strap mounted, hand held etc.).

- Within goggles there are no separate markets based on device shapes (monoculars, bi-ocular monoculars, binoculars and panoramic.)

(110) This results in the following relevant product markets:

i. Market for image intensification NVDs, possibly further segmented by device type;

ii. Market for thermal NVDs, possibly further segmented by device type;

iii. Market for fusion NVDs, possibly further segmented by integration technology (digital or optical). Within each integration technology, the market may be further segmented by device type;

iv. Market for digital low light sensor NVDs, possibly further segmented by device type.

5.1.1.2. Geographic market definition

A) Notifying Party's view

(111) The Notifying Party considers that the geographic market is EEA-wide.[123] First, the Notifying Party submits that NVDs have a very low transport-cost-to-price ratio and Harris, L3, and their competitors sell NVDs across the EEA irrespective of the location of their respective production facilities. Second, the Notifying Party argues that EEA customers rarely, if ever, source their NVDs on a national basis. Third, the Notifying Party is not aware of any EEA regulatory or national security restrictions preventing suppliers present in one EEA country from being active throughout the EEA. Certain tenders de facto eliminate US suppliers such as the Parties, as they require suppliers not to be subject to the US International Traffic in Arms Regulations ("ITAR"). However, to the extent any tender within the EEA would be limited to national or European producers only, then neither L3 nor Harris would be able to participate, entailing that the Transaction is neutral with respect to any such tenders.

B) Commission's decisional practice

(112) In the past, the Commission has left open the possibility to define markets for specific military and defence applications on an EEA-wide or national basis due to, e.g., the existence of specific government regulations (such export restrictions) or national security-related preferences for local suppliers.[124]

(113) The most recent case involving defence products was *Safran-Zodiac* case, which also concerned defence optronics (i.e. products that include NVDs). In this case the Commission followed the same approach and left the geographic market definition open (EEA or national) with respect to defence optronics.[125] In general (i.e. not necessarily with regard to defence optronics) the Commission noted that the geographic market can vary for different defence products based on how critical the technology is from a strategic and national security point of view. In the case of more sensitive systems and products customers can prefer national capabilities if they are available.[126]

C) Commission's assessment

(114) The market investigation broadly confirmed the views put forward by the Notifying Party.

(115) A large majority of customers and competitors agreed that NVDs used in different Member States are not significantly different in terms of customer preference, technical specifications, and regulatory requirements such that NVDs intended for one Member State can be used in another Member State.[127] TECNEX OY explained that "*Typically the end user needs and use cases are quite similar in*

123 Form CO, paragraph 202

124 Case COMP/M.4653 - MBDA/Bayern- Chemie, paras. 21 and 23; Case COMP/M.5032 – Roxel/Protac, recital 33; Case COMP/M.1309 – Matra/Aerospatiale, recital 45; Case COMP/M.1745, EADS, recital 163

125 Case COMP/M.8425 Safran/Zodiac, recital 300

126 Case COMP/M.8425 Safran/Zodiac, footnote 203

127 Q1 Questionnaire to customers, question 20, Q2 Questionnaire to competitors, question 31

different countries."[128] Likewise Theon explained that "*overall the requirements are the same.*"[129] The Land Armament Directorate of Italy held similar views: "*In the EEA, the regulatory differences among countries are slight*".[130] Elbit mentioned that some adjustments may be required (e.g. thermal devices need to be adjusted in countries with colder climates) but this was a minority view.[131] Over all the responses suggest demand-substitutability across the EEA.

(116) Moreover, to the extent that there are some demand differences, there was little indication that suppliers could not make the necessary adjustments without incurring significant time or costs. For example, Elbit did not indicate that the adaptations it referred to (e.g. adaptation of thermal devices in countries with colder climates) would require significant time or costs. [132]

(117) A large majority of customers and competitors confirmed that apart from the ITAR restriction, there are no regulatory or national security restrictions that would prevent suppliers of NVDs active in one EEA Member State from being active in another EEA Member State.[133] With respect to ITAR, the Commission agrees with the Notifying Party that such restriction results in a de facto exclusion of US suppliers in EEA tenders. This would normally justify separating an ITAR market (firms active in the EEA without US suppliers) and a non-ITAR market (all suppliers active in the EEA) but in the current case this is not important as both Parties are subject to ITAR. A majority of competitors also considered that the set of competitors is similar in different EEA countries.[134]

(118) Thus, both from a demand and supply perspective the market appears to be at least EEA-wide.

(119) As regards a larger than EEA-market, a large majority of customers and competitors considered that there are regulatory restrictions that would prevent suppliers of NVDs from specific countries outside the EEA from being active in tenders in the EEA.[135] The explanations, however, were quite vague as they referred to "*suppliers that belong to black list*", "*countries subjected to embargos*" and "*political agreements*". A clearer explanation was the already discussed ITAR. The Commission considers these responses refer to the geopolitical reality that NATO countries have some common standards and although these do not bind NATO members formally, these countries do not generally source defence systems from countries that are outside the alliance such as, for example Russia, China and India. This practice is shared not only by NATO members but also by non-NATO members that are NATO allies or closely cooperate with NATO (together: 'NATO allies') such as, for example, Australia, Israel, Finland, Sweden etc. For example Sweden's armed forces actively

128 TECNEX OY's response to Q1 Questionnaire to customers, question 20

129 Theon's response to Q1 Questionnaire to customers, question 20

130 Responses of Italy's Land Armament Directorate and Bristol Trust LLC to Q1 Questionnaire to customers, question 20

131 Elbit's response to Q2 Questionnaire to competitors, questions 31 and 32

132 Elbit's response to Q2 Questionnaire to competitors, questions 31 and 32

133 Q1 Questionnaire to customers, question 21, Q2 Questionnaire to competitors, question 34

134 Q2 Questionnaire to competitors, question 33

135 Q1 Questionnaire to customers, question 22

cooperate with NATO forces and aim to develop interoperable capabilities.[136] Within this block of NATO or NATO allied countries the suppliers that supply other armed forces (e.g. Chinese, Russian, Indian armed forces) cannot be considered as competitive constraints. There are some exceptions to this rule, as can be seen from the fact that a Russian supplier sold missile systems in Turkey, a NATO member. However, these exceptions are limited in number and are met with the alliance's disapproval.[137] Thus, NATO and NATO ally countries are also part of the relevant market or suppliers active in these countries need to be taken into account as competitive constraints. Of these two approaches, i.e. EEA-wide market with acknowledging constraints from suppliers in NATO and NATO ally countries or geographic market corresponding to NATO and NATO ally countries, the first approach appears more appropriate as competitive conditions could be more divergent in a large market encompassing not only the EEA but also the US, Japan, Turkey and Brazil.

(120) Although asked specifically on this point, the respondents of the market investigation did not indicate that their responses would differ depending on the product market segment. Thus the above mentioned responses apply to all the various product market segmentations retained by the Commission for the purpose of assessing the Transaction.

D) Conclusion on geographic market definition

(121) On the basis of the above, the Commission considers that the relevant geographic market for all the relevant NVD product markets listed in Section 5.1.1.1.E) comprises the EEA including competitive constraints by firms from NATO or NATO ally countries such as Elbit and the Parties. In the rest of Section 5, when the Commission uses EEA in the context of geographic market, EEA is to be understood in this way.

5.1.2. Competitive assessment – horizontal non-coordianted effects

5.1.2.1. Notifying Party's view

(122) Although in the Notofying Party's view there is a unified NVD market, the Notifying Party also puts forward its view on the basis of a segmentation based on technology type, i.e. image intensification NVDs, thermal NVDs and fusion NVDs.

(123) At both of these levels the Notifying Party submits that the Transaction will not lead to a significant impediment of effective competition for the following reasons:

i. The combined entity will not have EEA shares indicative of market power.[138] The combined entity will have a 2018 EEA value share for all NVDs of below [10-20]%. Moreover, the combined entity will have 2018 EEA value shares not exceeding [10-20]%.

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136 https://www nato.int/cps/en/natohq/topics_52535 htm

137 https://www.cnbc.com/2019/06/04/us-nato-ambassador-turkey-must-cancel-russia-s-400-missile-purchase html

138 Form CO, paragraphs 241-251

ii. The combined entity will face multiple viable competitors for any future night vision device opportunities.[139] These include Elbit, Thales, Theon, PCO, Qioptiq and others.

iii. The NVDs space is highly competitive, characterized by tender processes.[140] NVDs are typically purchased through tender processes. Consequently, as with any bidding market, a small number of competitors is sufficient to maintain a competitive outcome. Moreover, barriers to switching suppliers of NVDs are typically low in the EEA. In addition, the night vision space has been experiencing significant overcapacity since 2012 and significant pricing pressures as a result.

iv. The merged entity will face significant buyer power, characteristic of the defence sector in general.[141]

v. Harris and L3 are not particularly close competitors in the EEA.[142] This is because they meet in less than 20 % of the EEA tenders.

5.1.2.2. The Commission's assessment

(124) The Parties' activities overlap in the following relevant markets:

i. Market for image intensification NVDs in the EEA;

ii. Market for fusion NVDs in the EEA;

iii. If the market for image intensification NVDs is further segmented by device type, the markets for various image intensification NVD types, principally image intensification goggles and weapon sights in the EEA;

iv. If the market for fusion NVDs is further segmented based on integration technology, the market for optical integration fusion NVDs in the EEA;

v. If the market for optical integration fusion NVDs is further segmented by device types, the markets for various optical integration fusion NVD device types, principally optical integration fusion goggles in the EEA.

(125) The Commission will first analyse the horizontal overlaps at the level of image intensification and fusion NVDs (levels i. and ii. above). This will be followed by a discussion of levels iii.-v.

A) Image intensification NVDs

(a) Relevant characteristics of bidding markets

(126) The market for image intensification NVDs is a bidding market, which implies lumpy demand, i.e. large and infrequent tenders.

139 Form CO, paragraphs 252-253
140 Form CO, paragraphs 254-258
141 Form CO, paragraph 258
142 Form CO, paragraph 259

(127) As the Commission explained in Case M.7278 – GE/Alstom,[143] in markets characterised by tendering, the general mechanism through which a merger can influence competitive outcomes is similar to what occurs in mergers in ordinary differentiated product industries, where firms also compete on price. That is, a merger internalises the competitive pressure that two firms exercised on each other prior to the merger and can lead each of the remaining firms to bid less aggressively post-merger. The precise mechanism through which a merger can influence bids and the indicia of potential unilateral effects, depend on how the tendering process is set up and on the information available to bidders.

(128) There is no presumption in bidding markets that very few bidders (even as low as two bidders) are sufficient to generate a competitive outcome. This extreme result would theoretically only hold if suppliers sell identical products, have identical costs, have sufficient capacity to serve the entire market and have reliable information on the cost of the rival bidders. However, this result no longer holds if firms offer differentiated products, and therefore earn a margin over cost. As in the present case, bidding markets where firms offer differentiated products[144] are not characterised by the stylised perfectly competitive outcome and can generate non-coordinated effects if two competing firms merge.

(129) In bidding markets, prices are individually negotiated with each customer and, therefore, suppliers can typically engage in extensive price discrimination across customers. This means that a bid submitted to a customer in a specific tender does not have to be offered on similar terms to other customers in other tenders. The existence of individualised pricing means that the price effects of a merger may be targeted at a particular subset of customers, for example those that are more likely to substitute between the merging parties absent the merger. This follows from the fact that even though a price increase across all customers may not be profitable (given that too many customers would be able to substitute away from the merging parties), a price increase for a specific subset of customers may be so.

(130) In image intensification NVD tenders, prospective suppliers form and submit bids in a context where there is uncertainty over competing bids. In such settings, the pricing incentives of competing firms resemble those at work in ordinary markets with differentiated products. If there is uncertainty on the required price level of the winning bid, each firm faces a trade-off between the probability of winning the tender and the margin earned in case of winning the tender. A higher bid would reduce the probability of winning the tender but would also increase the margin if the bid is successful. This trade-off is equivalent to the standard trade-off between quantity sold and price in an ordinary differentiated goods market, the difference being that in the case of a tender it is the probability of winning rather than actual quantities sold which enters the trade-off. Each bidder therefore chooses its optimal bid in order to optimise the trade-off between expected sales and price and thereby maximises its expected profits. Pricing incentives and the related incentives to exploit market power in bidding markets are therefore analogous to those at work in standard pricing of differentiated products.

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143 Commission decision in Case M.7278 – GE/Alstom (2015), Annex I - The Commission's Economic Analysis of Bidding Data, recitals 7 et seq.

144 NVDs are obviously differentiated goods as firms NVDs are never exactly alike.

(131) The incentives to increase the bids[145] in bidding markets characterised by uncertainty over competing bids following a horizontal merger are very similar to those at work in ordinary markets with differentiated products. The primary difference is that the diversion of sales between competing firms should be understood in terms of expected sales (the probability of winning the tender) rather than actual sales. The size of the internalisation effect following a horizontal merger is thus determined by the closeness of competition between the merging firms, understood as the level of diversion between the merging firms before the Transaction (evaluated in terms of winning probabilities), and by the level of pre-merger margins.

(132) Finally, in situations characterised by uncertainty on the quality of rival offerings and on the customer evaluation for each of the products offered, the competitive constraint faced by each bidder is determined by the ex-ante probability that rival bidders may make more attractive offers and thus win the tender. When multiple bidders participate by paying a non-negligible cost, this means that, at the time of bid submissions, those bidders believed that they had a positive probability of winning. Therefore, facing more than one rival bidder typically increases the ex-ante probability that the buyer will prefer a rival offer, and therefore increases the competitive constraint on any given bidder. Therefore, it is not only the runner-up that represented a competitive constraint on the winning bidder, and a decrease in the number of remaining bidders due to the merger may result in a reduction of the competitive constraint faced by the Merged Entity.

(133) In summary, contrary to the arguments of the Notifying Party, just because the market for image intensification NVDs is organized as a bidding market, it does not follow that a low number of suppliers is sufficient to maintain a competitive outcome. In fact the effects of a merger in the market for image intensification NVDs are quite similar to the effects of mergers on ordinary (non-bidding) markets with differentiated products.

(134) This also implies that contrary to the Notifying Party's argument, market shares are valuable in assessing the market power of a supplier, which is also recognized by the European Court's case-law. Namely, the Court held that the mere fact that a merger takes place on a bidding market, "*does not mean that market shares are of virtually no value in assessing the strength of the various manufacturers* […],"[146]

(135) However, because demand is indeed lumpy, market shares over a longer period (multiple years) are more indicative of market power than market shares for a given year because large swings of market shares caused by the win or loss of a significant tender in a certain year are smoothed out. Consequently, the Commission will use market shares over a five year period i.e. 2014-2018.

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[145] In this decision, the terms "increased bids", "increased prices", "price increases" in the context of the effect of a merger are a shorthand to refer to increased prices, lower quality, less innovation, worse customer service or the deterioration of any relevant competitive parameter.

[146] Judgement of 14 December 2005 in case T-210/01 General Electric v Commission, EU:T:2005:456, paragraphs 149 and 150.

(b) Market shares

(136) As discussed in Section 5.1.2.2.A(a)), due to the characteristics of bidding markets, the most useful data to assess the market power of suppliers are the 2014-2018 market shares. It follows that the Notifying Party's argument that the combined market share of the Parties is as low as [10-20]% in 2018 is not relevant. Market share figures for all NVDs (i.e. also including thermal and fusion NVDs), including the [10-20]% figure for 2018, are also irrelevant because they do not correspond to the relevant product market retained by the Commission.

(137) The appropriate 2014-2018 market shares for image intensification NVDs are presented in Table 1 below.

Table 1 Market Shares for Image Intensification NVDs

Company	Market share (EEA) 2014-2018
Harris	[20-30]%
L3	[10-20]%
Combined	**[30-40]%**
Theon	[20-30]%
Thales	[20-30]%
PCO S.A.	[5-10]%
Elbit	[5-10]%
Qioptiq	[0-5]%
Others	[0-5]%

(138) The Transaction thus gives rise to a horizontally affected market. Furthermore, the market shares suggest that the merged entity will have significant market power, which approaches the level (40%) that, under certain circumstances, may be indicative of a dominant position.[147] By removing a significant constraint the Transaction is likely to lead to a serious loss of competition and a likely price increase. By eliminating an important competitive constraint, following the Transaction firms will be able to bid at a higher price at the same level of probability of winning as pre-Transaction.

(c) The Parties are strong competitive constraints

(139) Both Parties appear to be important and strong competitors. Precision Technic Defence submitted that "*L3 would be considered the leading in this technology, but basically the two main US OEM's of high tech NVD's"*[148] Safran was of the same view: "*To the best of Safran ED's knowledge, L3 is the worldwide leader*."[149] And "*To the best of Safran ED's knowledge, Harris is number 2 worldwide*."[150]

(140) Indeed, among the image intensification NVD competitors L3 and Harris were most often considered as "*credible today*" and "*credible in 3-5 years*", followed

147 Case 27/76 *United Brands Company and United Brands Continentaal BV v Commission of the European Communities*.

148 Response of Precision Technic Defence to Q1 Questionnaire to customers, question 23

149 Safran's response to Q1 Questionnaire to customers, question 24

150 Safran's response to Q1 Questionnaire to customers, question 25

by Thales. Theon and Elbit were considered equally often at tied fourth and fifth place.

(141) These results show that customers and competitors consider the Parties the two strongest competitors on the market for imagine intensification NVDs. The results appear to be reliable as the five suppliers that were considered most often as credible are the five firms with the highest market shares in the EEA.

(142) Moreover, respondents pointed out several strengths of both Harris and L3.[151] With regard to Harris, B.M.A.S.R.L considered that "*Harris offers higher quality for Aviation goggles, better prices for monocular goggles and image intensifiers, past references and servicing capabilities for everything*"[152] Bristol Trust explained that "*Harris has competitive prices and the products are reliable*"[153] Competitive prices, along with good quality and performance was also highlighted by Theon "*Very price competitive with good quality and performance products*"[154] Italy's Land Armament Directorate valued Harris's products because they are battle tested: "*Harris' devices are combat proven and largely used by the US Armed Forces, hence they collect and implement the requirements coming from the field in terms of quality, robustness and performances"*[155] Likewise TNVC pointed to Harris's proven track record "*Harris and fomerly ITT have an excellent track record and I have sold their image tubes for the last 15 years*".[156]

(143) All of these comments show that Harris scores well on a number of important competitive parameters such as price, quality and proven track record. While price and quality are important in all differentiated product markets, the battle tested nature of the products is a special asset in the defence sector. Further, a positive track record is an important competitive asset in bidding markets, where tenders require references and value such track record highly. This is especially true in the case of security related products and risk-averse public sector buyers.

(144) With regard to L3, Italy's Land Armament Directorate also highlighted the battle tested nature of the products, their quality and robustness.[157] Both L.F.E. SAS and Precision Technic Defence pointed to L3's track record with Special Forces, Navy and ground army.[158] Theon submitted that L3 has a "*Very price competitive with a very large and complimentary range of good quality and performance products*"[159] TNVC made a more specific comment on the quality of L3's products "*Consistent high spec tubes with very few blemishes"*[160]

(145) Thus, just like Harris, L3 also scores high on price, quality and the battle-tested nature of its products. Likewise, it also has the competitive asset of proven track

151 Q1 Questionnaire to customers, question 26
152 Response of B.M.A.S.R.L to Q1 Questionnaire to customers, question 26
153 Bristol Trust's response to Q1 Questionnaire to customers, question 26
154 Theon's response to Q1 Questionnaire to customers, question 26
155 Response of Italy's Land Armament Directorate to Q1 Questionnaire to customers, question 26
156 TNVC's response to Q1 Questionnaire to customers, question 26
157 Response of Italy's Land Armament Directorate to Q1 Questionnaire to customers, question 27
158 Responses of L.F.E. SAS and Precision Technic Defence to Q1 Questionnaire to customers, question 27
159 Theon's response to Q1 Questionnaire to customers, question 27
160 TNVC's response to Q1 Questionnaire to customers, question 27

record and references and can boast in this regard of such references as the Special Forces of the US Army and Navy.

(146) Finally, having an own, in-house I2T production (vertical integration) was also pointed out as competitive strength.[161] Indeed Harris and L3 are the only image intensification NVD suppliers that directly control the key technology of their devices. The rest of the image intensification NVD suppliers source I2Ts from Photonis.

(147) Thus the Commission considers that both Harris and L3 are important competitive constraints and possibly the strongest competitors. This reinforces the finding that the Transaction is likely to lead to a significant impediment of effective competition.

(d) Closeness of competition

(148) The Notifying Party submitted that the Parties are not close competitors as they meet in less than 20 % of the EEA tenders. However, this meet rate was counted on the basis of all NVDs and not only on the basis of image intensification NVDs. When considering only the latter Harris and L3 bid against each other in [20-40]% of the tenders.[162] Considering that there are 4 large competitors and 2-3 smaller ones, this meet rate indicates significant competitive interaction between the Parties.

(149) Further, the ultimate question with regard to closeness is the degree of substitution between the Parties' products.

(150) In this regard, the market investigation produced consistent evidence that the products of Harris and L3 are close substitutes. Namely a large majority of customers and competitors considered that the Parties' products are close substitutes.[163] Specifically, respondents considered that Harris and L3 produce similar devices with similar performance levels[164] and that their devices have very similar technical parameters.[165] Safran submitted that their products are generally equivalent.[166] In addition, it was pointed out that their products are close substitutes because both bid in the tenders of the US Armed Forces and thus both have to comply with the US Armed Forces' standards and specifications. [167] United Technologies Corporation highlighted that the sensors in Harris's and L3's image intensification NVDs are similar.[168] Respondents also provided specific examples of close or equivalent product pairs from the Parties' respective

161 Safran's responses to Q1 Questionnaire to customers, questions 26 and 27
162 Form CO, Annex RFI2 10
163 Q1 Questionnaire to customers, question 23, Q2 Questionnaire to competitors, question 33
164 Response of B.M.A.S.R.L to Q1 Questionnaire to customers, question 23
165 Response of Lithuania's Ministry of Defence to Q1 Questionnaire to customers, question 23
166 Safran's response to Q2 Questionnaire to competitors, question 23
167 Response of L.F.E. SAS to Q1 Questionnaire to customers, question 23
168 Response of United Technologies Corporation to Q2 Questionnaire to competitors, question 33

portfolios, such as AN/PVS-31(L3) – F5032 BNVD (Harris)[169] and M949 (L3) – f4949 (Harris).[170]

(151) On the basis of the above, the Commission considers that the Parties' are close competitors and that, consequently, the price increase that may result from the Transaction would be significant.

(e) Buyer power

(152) The majority of respondents to the market investigation considered that buyer power on the market for all NVDs is strong.[171] Purchases in large quantities were mentioned as a factor that affords buyers a favourable negotiating position.[172] However, certain smaller customers, such as the Ministry of Defence of Lithuania rated its buyer power as weak.[173]

(153) The number of customers is not large (as in the case of consumer goods) but not very low either, i.e. the customer base is much larger than a few large buyers. In the relevant market there are more than 30 governments and each government has several bodies (e.g. army, police etc.) that purchase NVDs. There are also corporate customers. The size of the customers also varies from very large (US Department of Defence) to small (smaller armed forces or police forces, small corporate customers). Thus, the structure of the demand side does not imply that buyer power is strong and the buyer power of certain customers can even be weak. The Commission adds that, as explained in Section 5.1.2.2.A.(a), in markets such as the market for image intensification NVDs suppliers can price discriminate and thus can exploit the lack of buyer power of smaller customers.

(154) In addition, certain respondents pointed out that the reason for buyer power is sufficient competition among suppliers[174] In other words, buyer power depends on a competitive market where the customer can play suppliers off against one another. Indeed, if competition weakens as a result of the Transaction, the customer has more limited and worse choices (higher prices, worse quality) than pre-Transaction and it is unlikely that it can counterbalance this by being more assertive. This is all the more likely given the fact that defence equipment is by definition critical to national security and safety and thus customers are unlikely to drive a hard bargain if they think that the lower purchase price could compromise performance and quality.

(155) For the reasons above, the Commission considers that buyer power is unlikely to mitigate the negative effects of the Transaction.

169 Response of Italy's Land Armament Directorate to Q1 Questionnaire to customers, question 25

170 Response of L.F.E. SAS to Q1 Questionnaire to customers, question 25

171 Q1 Questionnaire to customers, question 36, Q2 Questionnaire to competitors, question 51

172 Response of Australia's Department of Defence

173 Responses of the Lithania's Ministry of Defence and Precision Technic Defence to Q1 Questionnaire to customers, question 36

174 See the responses of Safran, Thales and PCO S.A. to Q2 Questionnaire to competitors, question 52

(f) Entry and expansion

(156) Respondents of the market investigation pointed to several barriers to entry.[175]

(157) First, any entrant needs to develop an advanced technology, which involves significant R&D spending.[176] In addition any entrant would face considerable uncertainty since developing the underlying I2T technology is very challenging, which is shown by the fact that there are only three suppliers in the relevant market for I2Ts. Even if the I2T could be sourced froma third party, developing a device that fulfils all user needs at the level required for modern military applications is a complex task in itself. Further, a new entrant has no order backlog to support R&D costs while it competes with incumbents that already have the technology and can support their R&D from revenues from their order backlog.

(158) Second, even if an entrant develops the relevant technology, it has to be credible. As Elbit put it "*you'll need to show product credibility if you want to sell to the governmental market*."[177] Indeed the product needs to work reliably in practice in the various, often extreme, situations and circumstances that armed forces have to be prepared for. This also involves significant development work, practical testing and requires familiarity with mission situations from the perspective of a device used, which is hard to acquire as a new entrant.

(159) Third, tenders require references,[178] which a new entrant lacks by definition. This makes it challenging to win the first contract, which in turn makes it challenging to acquire the relevant references. Breaking this negative feedback loop is a significant barrier. In addition, the breadth and quality of the portfolio of references is also valued, which further reinforces the negative feedback loop for the entrant and positive feedback loop for the incumbent.

(160) Fourth, tender procedures are costly and complex,[179] which increases the transaction costs an entrant has to support with little or no order backlog.

(161) Fifth, a new entrant has to build a sales and repair network,[180] which increases substantially the initial investments necessary to enter. In this respect also, incumbents support such fixed costs much easier than new entrants.

(162) Sixth, a majority of respondents considered that suppliers that have already supplied a customer have an advantage with that customer relative to other suppliers.[181] This is due to familiarity resulting from existing relationships, proven track record with the specific customer, or preference for a certain supplier for other reasons. Contrary to a new entrant, all incumbents enjoy this advantage to a certain extent due to their existing track record of deliveries.

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175 Q1 Questionnaire to customers, question 33, Q2 Questionnaire to competitors, question 46

176 Responses of Safran and Italy's Land Armament Directorate to Q1 Questionnaire to customers, question 33, Elbit's response to Questionnaire to competitors, question 46

177 Elbit's response to Q2 Questionnaire to competitors, question 46

178 Theon's response to Q2Questionnaire to competitors, question 46

179 Thales's response to Q2 Questionnaire to competitors, question 46

180 PCO S.A.'s response Q2 Questionnaire to competitors, question 46

181 Q1 Questionnaire to customers, question 29, Q2 Questionnaire to competitors, question 42

(163) The very same factors also make significant expansion difficult.

(164) In addition, there has not been large scale entry or expansion in the last ten years.[182] Current suppliers entered the market a decade or more than a decade ago.[183] Thus the market has been stable for a long time and has been characterised by the presence of the same firms as today. Moreover, a majority of respondents do not expect large scale entry or expansion in the next 3-5 years.[184]

(165) The Commission notes that certain barriers would be lower in the case of existing thermal NVD providers as these providers have experience in designing NVDs, have some order backlog to support development and tender costs and already have a sales and repair network and some customer relationships. In other words, the first barrier (technological barrier) the fourth barrier (tender costs), the fifth barrier (sales and repair network) and sixth barrier (customer relationships) would be lower for a thermal NVD provider. The first, fourth and fifth barriers barriers would be lower but not be non-existent because a new technology requires a new architecture for the device (first barrier), the tender costs would still have to be supported (fourth barrier) and the sales and repair network needs to be retrained (fifth barrier). In addition, even a thermal provider would face the second and third barriers (credibility of the device and references). Thus, even in such a case the barriers would be considerable, which is shown by the fact that the set of firms supplying image intensification NVDs has been stable for a long time.

(166) Based on the above, the Commission considers that entry or expansion is unlikely to mitigate the likely anticompetitive effects of the Transaction.

(g) Conclusion on image intensification NVDs

(167) On the basis of the above the Commission considers that in relation to the market for image intensification NVDs, the Transaction raises serious doubts as to its compatibility with the common market.

A) Fusion NVDs in the EEA

(a) Market shares

(168) For the reasons discussed in relation to image intensification NVDs, market shares on the basis of a five year period are also the best indicators of market power in the case of fusion NVDs. The relevant market shares are presented below.

[182] Responses of Promoteq and Italy's Land Armament Directorate to Q1 Questionnaire to customers, question 33, Q2 Questionnaire to competitors, question 47

[183] Q2 Questionnaire to competitors, question 50

[184] Q1 Questionnaire to customers, question 35, Q2 Questionnaire to competitors, question 48

Table 2 Market Shares in fusion NVDs

Company	Market Share (EEA) 2014-2018
Harris	[0-5]%
L3	[20-30]%
Combined	**[20-30]%**
Thales	[40-50]%
Qioptiq	[30-40]%

Source: Form CO paragraph 223, table 20

(169) The Transaction thus gives rise to an affected market in fusion NVDs. As the market shares show, the Transaction reduces the number of competitors from four to three, which generally implies a serious loss of competition and a likely price increase. However, in this case the increment is minor, only [0-5]%, as Harris has a minimal market share. Based on market shares it does not appear to have market power in the EEA. Given the small market share, if L3 raised its price pre-Transaction few customers would switch to Harris due to its small presence in the market. Thus, in the case of a significant post-merger price increase, few customers would remain in-house and the merged entity would likely lose customers to the remaining competitors such that its overall profit would decrease. This limits the incentives of the the merged entity to increase its price post-Transactuon.

(b) Other aspects

(170) The assessment as regards the market for fusion NVDs is similar to the assessment with respect to image intensification NVDs. This is because certain factors in the assessment are the same (for example, the nature of bidding markets or buyer power). Also, the responses in the market investigation did not differ on the basis of the underlying technology used in the device even though respondents were asked to highlight differences between different potential NVD markets, if any. Thus the Commission briefly reviews the main points of the assessment by reference to the results discussed in relation to image intensification NVDs, indicating the differences where necessary.

(171) However, there are important differences affect the Commission's assessment of the likely effects of the Transaction on the market for fusion NVDs.

(172) *Market characteristics*. As discussed in Section 5.1.2.2.A(a) the fact that the NVD markets are bidding markets does not imply that a low number of suppliers is sufficient to guarantee a competitive outcome. Thus it does not imply that a merger cannot have negative effects on such markets.

(173) *Parties' competitive strength*. For the reasons discussed in Section 5.1.2.2.A(c) the Parties are important and strong competitors in image intensification NVDs. The responses of the market investigation reviewed in that section also apply to the market of fusion NVDs as respondents did not differentiate in their replies between NVDs of different technologies. However, there are two important differences. First, in image intensification NVDs the competitive advantage of having the technology in-house (vertical integration) applies to both Parties but in fusion NVDs it only applies to L3 as Harris sources it from third party providers. Thus Harris is a less strong competitor in fusion NVDs as it does not control one

of the core technologies in these devices, including its costs. Second, although Section 5.1.2.2.A(c) showed that the Parties are strong competitors, this is only true in the sense that Harris is a capable competitor in all NVDs globally but not necessarily in the EEA. Harris's small market share in the relevant market indicates that it is not focused on the EEA. Further, the Commission's investigation did not find indications that Harris wants to significantly expand its activities in the EEA. It follows from the above that due to these differences Harris is not a strong competitor in fusion NVDs in the EEA.

(174) *Closeness.* The respondents in the market investigation did not differentiate their responses on the basis of NVDs of different technologies also in the case of closeness. Thus, as discussed in in Section 5.1.2.2.A(d), the Parties are close competitors because their devices have similar performance levels and technical parameters, use similar sensor technology and both complies with the specifications of the US military. However, closeness only applies in the sense of their products but not in terms of geography. Because Harris is not focused on the EEA, the Parties are not close competitors in the geographic sense.

(175) *Buyer power*. Buyer power does not depend on the technology employed in the device. The structure of demand for fusion NVDs is the same as for image intensification NVDs and thus the results of the analysis in relation to image intensification NVDs (5.1.2.2.A(e)) apply also to fusion NVDs. Thus, for the reasons explained, some customers have a degree of market power but some do not and in any case customers are unlikely to be able to counteract a price increase resulting from the loss of competitive pressure via the Transaction.

(176) *Entry and expansion.* In Section 5.1.2.2.A(f), the Commission explained that the barriers to entry to and expansion in image intensification NVDs are high. The results of the market investigation apply also to fusion NVDs as the respondents did not differentiate their responses on the basis of technology. Thus the barriers are high, especially for new entrants. Just like in the case of image intensification NVDs, the barriers are somewhat lower for suppliers that already have capabilities in NVDs. As discussed in relation to market definition, it is easier to enter the fusion NVD market for standalone thermal NVD and standalone image intensification by sourcing the missing technology, the same way as Harris did. While the analysis on image intensification NVDs indicates that the barriers remain considerable even for existing NVD providers, the example of Harris suggests that the barriers in this case are easier to overcome.

(c) Conclusion on fusion NVDs

(177) The Transaction involves the reduction of the number of suppliers of fusion NVDs from four to three, which can potentially imply a significant loss of competition Further, just like in the case of image intensification NVDs buyer power cannot be relied on to mitigate the effects of the Transaction and entry barriers are considerable.

(178) However, the combined market shares for fusion NVDs are much lower than in image intensification NVDs and just above the threshold where generally competition concerns can be expected to arise. Further, the market share increment is very small, suggesting that the market power of the merged entity will only be marginally higher as a result of the Transaction and is unlileky to

increase incentives to increase prices. In addition, the Parties are not close competitors in the geographic sense and there is no indication that Harris will become a more important competitor in the EEA in the future. Moreover, the example of Harris's entry by sourcing thermal technology suggests that entry barriers may be somewhat lower than in image intensification NVDs.

(179) Based on the above considerations, on balance the Commission is of the view that the Transaction does not give rise to serious doubts as to its compatibility with the internal market in relation to fusion NVDs.

B) Assessment under other relevant market definitions

(180) As explained in Section 5.3.2, the Transaction gives rise to additional overlaps if alternative plausible market definitions were retained. These additional overlaps would arise in the following markets:

i. If the market for image intensification NVDs is further segmented by device type, the markets for various image intensification NVD types, namely image intensification goggles and weapon sights in the EEA[185];

ii. If the market fusion NVDs is further segmented based on integration technology, the market for optical integration fusion NVDs in the EEA;

iii. If the market for optical integration fusion NVDs is further segmented by device types, the markets for various optical integration fusion NVD device types, namely optical integration fusion goggles and optical integration fusion weapon sights in the EEA.

(181) In this respect the Commission notes that pursuant to the serious doubts raised in this decision, including in the relevant market for image intensification NVDs, the Notifying Party offered commitments to address any competition concerns related to this market. These commitments consist of the divestment of Harris's entire night vision business including both NVDs and I2Ts. As discussed in detail in Section 6, these commitments remove the entire overlap in all possible night vision market segments and they are well designed to address the competition concerns in the area of night vision, regardless of any other alternative segmentations. It is thus not necessary to carry out a competitive assessment under the alternative market definitions relating to NVDs.

5.1.3. Competitive assessment – horizontal coordinated effects

5.1.3.1. The Notifying Party's view

(182) The Notifying Party submits that the Transaction will not give rise to coordinated effects.[186] First, it considers that the lack of product homogeneity renders implausible any implicit coordination, especially in a tender market. Second, the market is not transparent as it is to a large extent a bidding market, rendering any implicit collusion inherently unstable. Third, the market is driven by innovation

[185] As discussed in Section 5.1.1.1.D(a.v), there is no overlap between the Parties in device types other than goggles and weapon sights.

[186] Form CO, paragraphs 260-261

given the technological features of the products. This feature too prevents the possibility of implicit and sustainable coordination for any significant period of time.

5.1.3.2. Commission's assessment

(183) The Commission agrees with arguments put forward by the Notifying Party. It is indeed the case that NVDs are a heterogeneous product group with various functionalities and multiple parameters (i.e. not only price but also quality, performance levels, energy consumption, shape, weight etc), which makes it difficult for competitors to implicitly reach a common understanding on the terms of coordination.

(184) Maintaining the coordination also appears difficult for several reasons. First the market is indeed not transparent, which makes montoring the deviations from the agreed terms of coordination difficult. Second, the lumpy nature of demand incentives firms to cheat on the agreed terms. Third, it is indeed the case that NVD markets are characterised by innovation, which renders any tactic coordination unstable.

(185) The assessment applies to image intensification NVDs, fusion NVDs and the other alternative relevant product markets discussed in Section 5.1.2.2.B)

(186) In any event, the commitments offered by the Notifying Party remove the entire overlap in the night vision space and thus the Transaction will not give rise to any horizontal coordinated effects in any NVD market.

5.2. I2Ts

5.2.1. Market definition

(187) I2Ts are devices that intensify an image by converting photons to electrons, multiplying the electrons and reconverting them to photons. I2Ts are the core component of an image intensification NVD as they constitute the core technology on which an image intensification NVD is based.

5.2.1.1. Product market definition

A) Notifying Party's view

(188) The Notifying Party considers that I2Ts are components and the key input for image intensification night vision. The Notifying Party does not consider any further segmentation within I2Ts.[187]

B) Commission's decisional practice

(189) The Commission has never considered I2Ts separately from the broader category of defence optronics and thus the precedents are the same as those discussed in relation to NVDs in Section 5.1.1.1.C) above. Namely, in *Safran/Zodiac* and *Daimler Benz/Carl Zeiss* the Commission has distinguished defence optronics, a

[187] Form CO, paragraph 192

category that includes thermal NVDs, image intensification NVDs, visors mounted on land vehicles, ships, aircraft or submarines and a range of other products unrelated to image intensification NVDs or I2Ts. [188] With regard to further possible segmentation of the category of defence optronics, the Commission noted that technologies used to manufacture various types of optronics equipment are similar but that the supply and demand landscapes are not necessarily the same for all products.[189] Ultimately, the Commission left the question of finding separate markets within defence optronics open.

C) Commission's assessment

(190) As a preliminary remark, in Sections 5.1.1.1.D)-E) the Commission concluded that NVDs of different underlying technologies (image intensification, thermal, fusion and digital low light sensor technology) belong to separate markets. It follows that I2Ts, which are a key component of NVDs using image intensification technology, are also not substitutable with the key components of thermal technology or digital low light technology.

(191) Thus the only question with regard to product market definition is whether different generations of I2Ts (generation I-III) belong to the same market. This is in line with the market investigation, which did not indicate that any other segmentation would need to be considered. To the extent that there are size and weight differences these are already captured by the distinction between I2Ts of different generations, as discussed in the following recital.

(192) In Sections 5.1.1.1.D(a.iii) the Commission concluded that there is no demand substitution across image intensification NVDs using different generations of I2Ts due to different performance levels. This is equivalent to saying that image intensification I2Ts of different generations are also not demand substitutable. Other than different performance levels, respondents added that I2Ts of different generations are used for different purposes and have different sizes and weights, the latter of which also implies that they cannot be used for the same device.[190] It was also confirmed by a large majority of respondents that customers either specify the technology generation in their tenders or specify the performance criteria corresponding to a particular generation of I2Ts.[191] It follows that in I2T tenders I2Ts of a previous generation compared to the I2T that is required would not be accepted as they do not meet the performance specifications and later generation I2Ts would not be competitive on price. Indeed, respondents confirmed that I2Ts of later generations are significantly more expensive than those of earlier generations.[192] The fact that only an I2T of a particular generation is acceptable in response to an I2T tender rules out demand substitution.

(193) As regards supply side substitution, respondents were equally split on the question whether a supplier of a certain generation of I2T can produce another

188 Case COMP/M.8425 Safran/Zodiac, recitals 255 and 257; Case IV/M.598 Daimler Benz/Carl Zeiss, recitals 8-9

189 Safran/Zodiac, recitals 255-257

190 Q1 Questionnaire to customers, question 38, Q2 Questionnaire to competitors, question 54

191 Q1 Questionnaire to customers, question 39, Q2 Questionnaire to competitors, question 55

192 Q2 Questionnaire to competitors, question 56

generation within a short time and without substantial difficulties.[193] The respondents supporting easy switching are actually NVD suppliers that procure I2Ts and it appears that they replied to the question from their own perspective. Indeed, as discussed in Section 5.1.1.1.D(b.iii), for an NVD maker it is easy to switch between NVDs of different devices as they procure the I2Ts and just adjust the other aspect of the device. This, however, may not apply to I2T manufacturers. Indeed, the technological advances represented by each new generation suggest that supply substitution is likely to be asymmetrical in that producers of later generation I2Ts can easily produce earlier generations but not vice-versa because it requires substantial R&D efforts to develop a new generation. For example, as discussed in Section 5.1.1.1.D(b.iii) there is no certainty whether ongoing efforts to develop a generation IV I2T will bear fruit and when.

(194) However, for the purpose of the assessment of the Transaction, the question is moot as there are only three suppliers of I2Ts in the EEA and all three suppliers are able to produce the latest generation (generation III) tubes and thus are able to switch easily to producing earlier generation I2Ts. Further, as mentioned in the previous recital, there is no supplier that will be able to produce generation IV I2Ts within the next 2-3 years with a reasonable degree of certainty and thus generation IV technology also does not serve a distinguishing factor among suppliers.

D) Conclusion on product market definition

(195) Based on the above, the Commission considers that it is not necessary to distinguish separate markets for I2Ts of different generations. The relevant product market is therefore the market for I2Ts without any further segmentation.

5.2.1.2. Geographic market definition

A) Notifying Party's view

(196) With regard to geographic market definition, the Notifying Party treats NVDs and I2Ts the same way and considers that the market is EEA-wide for the same reasons as the ones it put forward in the case of NVDs.[194] As explained in Section 5.1.1.2.A, these reasons include the low transport-cost-to-price ratio, the absence of national sourcing by customers and the lack of regulatory or national security restrictions.

(197) Certain tenders de facto eliminate US suppliers such as the Parties, as they require suppliers not to be subject to the US International Traffic in Arms Regulations ("ITAR"). However, to the extent any tender within the EEA would be limited to national or European producers only, then neither L3 nor Harris would be able to participate, entailing that the Transaction is neutral with respect to any such tenders.

193 Q2 Questionnaire to competitors, question 57

194 Form CO, paragraph 202

B) Commission's decisional practice

(198) The Commission precedents are the same as in the case of image intensification NVDs (Section 5.1.1.2.C)) as so far the Commission has only considered broader categories.

(199) To recall, in the case of military and defence applications and products in general the Commission has left open the possibility to define markets for specific military and defence applications on an EEA-wide or national basis due to, e.g., the existence of specific government regulations (such export restrictions) or national security-related preferences for local suppliers.[195]

(200) The most recent case involving defence products was the *Safran-Zodiac* case, which also concerned defence optronics (i.e. products that include NVDs and I2Ts). In that case the Commission followed the same approach and left the geographic market definition open (EEA or national) with respect to defence optronics.[196] In general (i.e. not necessarily with regard to defence optronics) the Commission noted that the geographic market can vary for different defence products based on the how critical the technology is from a strategic and national security point of view. In the case of more sensitive systems and products customers can prefer national capabilities if they are available.[197]

C) Commission's assessment

(201) A large majority of respondents agreed that, within the EEA, regulatory requirements, customer preferences and specifications are similar and as a result the same I2Ts can be used throughout the EEA.[198] This means that there is demand-substitutability in the EEA and there are no country-specific I2Ts. In addition, United Technologies Corporation considered that even if this were not the case, suppliers could easily adapt their products to the national specificities.[199] Thus it appears that demand and supply substitution applies across the EEA. These responses also confirm that that there are no regulatory barriers that would prevent suppliers from being active across the EEA with the same product. Thus the market is at least EEA-wide.

(202) In addition, the example of the Parties – two US firms supplying I2Ts from the US to the EEA without having production capacities in the EEA – indicates that the market may even be larger than the EEA. However, in line with the Commission's assessment in Section 5.1.1.2.C, the market cannot be larger than the circle of NATO and NATO ally countries because these countries *de facto* do not source defence products from outside the alliance, i.e. from China, Russia, India etc. In other words, I2T suppliers from non-NATO or non-NATO ally countries are not constraints within the alliance and in the EEA. As discussed in Section 5.1.1.2.C, there are exceptions to this practice, such as Turkey's purchase

195 Case COMP/M.4653 - MBDA/Bayern- Chemie, paras. 21 and 23; Case COMP/M.5032 – Roxel/Protac, recital 33; Case COMP/M.1309 – Matra/Aerospatiale, recital 45; Case COMP/M.1745, EADS, recital 163

196 Case COMP/M.8425 Safran/Zodiac, recital 300

197 Case COMP/M.8425 Safran/Zodiac, footnote 203

198 Q1 Questionnaire to customers, question 40, Q2 Questionnaire to competitors, question 58

199 Response of United Technologies Corporation to Q2 Questionnaire to competitors, question 58

of Russian weapons but these are limited in number and are met with the alliance's disapproval. Thus NATO and NATO ally countries are also part of the relevant market or firms suppling from these countries need to be taken into account as competitive constraints.

(203) Just like in the case of NVDs, the Commission notes that, in line with the view of the Notifying Party, certain tenders de facto exclude US firms by requiring that the bidders not be subject to ITAR. Given, however, that both Parties are subject to ITAR, neither of the Parties could participate in such tenders and thus the Transaction has no impact on these tenders.

D) Conclusion on geograhpic market definition

(204) On the basis of the above the Commission considers that the relevant geographic market for I2Ts comprises the EEA including competitive constraints by firms that supply the EEA from NATO or NATO ally countries such as Elbit and the Parties. In the rest of this section, when the Commission uses EEA in the context of geographic market, EEA is to be understood this way.

5.2.2. Competitive assessment – horizontal non-coordinated effects

5.2.2.1. Notifying Party's view

(205) The Notifying Party considers that the Transaction will not lead to competition concerns in I2Ts for the following reasons.

(206) First, the combined entity will not have EEA shares indicative of market power.[200] The combined entity will have a 2018 EEA value share below [20-30]% in I2Ts.

(207) Second, L3 is not a significant competitor in the EEA[201] as it has participated in only a few tenders and was especially absent in large tenders in the last four years. Furthermore, [L3's market position]. The Notifying Party considers that by 2030 Generation IV tubes will almost entirely replace Generation III tubes.

(208) Third, the combined entity will face Photonis, the market leader in the EEA.[202] The Notifying Party expects Photonis to compete strongly in the future as it claims to have Generation IV technology.[203] In addition, other providers, like Katod, a Russian I2T supplier, could start supplying I2Ts into the EEA. [204] The Notifying Party also expects that digital low light sensor technology will replace I2Ts in the long term.[205]

(209) Fourth, the Notifying Party argues that the I2T space is highly competitive, characterized by tender processes.[206] Consequently, as with any bidding market, a

200 Form CO, paragraphs 241
201 Form CO, paragraphs 235-236
202 Form CO, paragraphs 234
203 Form CO, paragraph 237
204 Form CO, paragraphs 234
205 Form CO, paragraph 238
206 Form CO, paragraphs 254-258

small number of competitors is sufficient to maintain a competitive outcome. Moreover, barriers to switching suppliers of I2Ts are typically low in the EEA. In addition the night vision space has been experiencing significant overcapacity since 2012 and significant pricing pressures as a result.

(210) Fifth, the merged entity will face significant buyer power, characteristic of the defence sector in general.[207]

(211) Sixth, Harris and L3 are not particularly close competitors in the EEA as they meet in only a few tenders.[208]

5.2.2.2. The Commission's assessment

A) Relevant characteristics of bidding markets

(212) As discussed in Section 5.1.2.2.A(a) in relation to NVDs the fact that the market for I2Ts is a bidding market does not imply that a low number of suppliers is sufficient to guarantee a competitive outcome. Thus it does not imply that a merger cannot have negative effects on such markets.

B) Market shares

(213) For the reasons discussed in relation to image intensification NVDs, market shares on the basis of a five year period are also the best indicators of market power in the case of I2Ts. The Parties' combined market shares for I2Ts are presented below.

Table 3 Market shares in I2Ts

Company	Market Share (EEA) 2014-2018
Harris	[20-30]%
L3	[0-5]%
Combined	**[20-30]%**
Photonis	[70-80]%

Source: FORM CO, paragraph 231, Table 21

(214) Thus, the Transaction gives rise to a horizontally affected market in I2Ts. As shown by the market shares, the market is extremely concentrated and comprises only three players. The Transaction results in a 3-to2 merger. The reduction of the number of market players from three to only two implies a serious loss of competition even if L3's market share is relatively low. If L3 is a credible competitor, its disappearance as an independent competitive force on such a concentrated market is likely to lead to significant price increases. Furthermore, Photonis is likely to be to be a dominant player, which implies that competition is already weak in this market. Consequently, any further reduction of competitive constraints implies significant harm to competition.

[207] Form CO, paragraph 258

[208] Form CO, paragraphs 235-236

C) The Parties' competitive strength

(215) Not surprisingly, Harris, which has a significant market share in the EEA, was considered a strong competitor by respondents to the market investigation.[209] B.M.A.S.R.L considered that "*Harris' competitive strengths are high quality, price, past references, customisation and servicing capabilities for all devices*"[210] Bristol Trust and Theon submitted that Harris is strong on both price and quality/performance.[211] Other than quality, Italy's Land Armament directorate also highlighted Harris's track record *"Harris' competitive strengths are the quality and the past reference"*[212], a point echoed by TNVC.[213]

(216) Despite its relatively low market share, L3 was also considered a strong competitor.[214] For example, Elbit's considered that L3 is a major player in I2Ts.[215] More specifically, Griffity Defense was of the view that L3's products have the same quality as Harris's: "*L3 and Harris Generation 3 Image Intensifier have the same quality. The L3 Image Intensifier show a more amber display whereas Harris is more green*."[216] Theon told the Commission that, just like Harris, L3 is strong on both quality/performance and price.[217] TNVC submitted that L3 has *"Consistently high spec clean tubes."*[218] The fact that L3's tubes are "unfilmed" was referred to as a particular strength in quality by L.F.E. SAS.[219] PCO highlighted that thanks to its US based operations L3 benefits from scale economies. [220]

(217) Furthermore is discussed in Section 5.2.2.2.D) below respondents considered that L3 offers products that are very similar in price and quality to Harris's products.

(218) The Commission also notes that, as discussed in Section Section 5.1.1.1.D(b.iii) respondents to the market investigation were sceptical of Photonis's claims to have generation IV technology and generally considered that it is uncertain when and Generation IV I2Ts will be brought to market and by which supplier. Accordingly, L3 cannot be considered to be weaker and Photonis cannot be considered to be a stronger competitor on this basis. Likewise, the relative immaturity of digital low light sensor technology discussed in Section 5.1.1.1.D(a.ii) implies that the loss of L3 as a competitive force will not be compensated by suppliers of this technology.

(219) On the basis of the above, despite its relatively low market share in the EEA, L3 is a credible competitor in I2Ts. Thus, the Commission considers that its disappearance in a very concentrated market where one player is likely to be dominant is likely to lead to a serious loss of competition.

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209 Q1 Questionnaire to customers, question 44, Q2 Questionnaire to competitors, question 63
210 B.M.A.S.R.L response to Q1 Questionnaire to customers, question 44
211 Responses of Bristol Trust and Theon to Q1 Questionnaire to customers, question 44
212 Response to Italy's Land Armament Directorate to Q1 Questionnaire to customers, question 44
213 TNVC's response to Q1 Questionnaire to customers, question 44
214 Q1 Questionnaire to customers, question 45, Q2 Questionnaire to competitors, question 64
215 Elbit's response to Q2 Questionnaire to competitors, question 64
216 Response of Griffity Defense Gmbh to Q1 Questionnaire to customers, question 45
217 Theon's response to Q1 Questionnaire to customers, question 45
218 TNVC's response to Q1 Questionnaire to customers, question 45
219 Response of L.F.E. SAS to Q1 Questionnaire to customers, question 45
220 PCO SA's response to Q2 Questionnaire to competitors, question 64

D) Closeness of competition

(220) With regard to closeness, the market investigation produced consistent evidence that the products of Harris and L3 are close substitutes. A large majority of customers and competitors considered that the Parties' products are close substitutes.[221] Specifically, respondents considered that the technology and quality levels of their products are similar[222] and that they have comparable performance levels.[223] A respondent considered that Harris's and L3's products are generally equivalent.[224] In addition, it was pointed out that their products are close substitutes because both supply NVDs to the US Armed Forces and thus both firms have to comply with the US Armed Forces' standards and specifications. For example, L.F.E SAS submitted that "*They have the same products due to the US tenders which request them to be interchangeable (size, electronics, mechanics)"*[225] TNVC was of the same view: "*They produce image tubes for the same military contract. If that isn't interchangeable I don't know what is*."[226] United Technologies Corporation highlighted that the sensors in Harris's and L3's image intensification NVDs are similar.[227]

(221) Thus, with regard to the substitutability of their products Harris and L3 are close competitors, which exacerbates the harm that is likely to follow from the Transactions.

(222) Given that L3's products are close substitutes of Harris's products, L3's relatively small market share can be explained by its more modest presence in the EEA. In other words, the Parties are less close competitors in the geographic sense. However, in the context of a very concentrated market where there is a dominant player, the disappearance of every credible competitive constraint (like the constraint exercised by L3) is likely to lead to a significant impediment of effective competition.

E) Buyer Power

(223) The majority of respondents to the market investigation considered that buyer power on the market for I2Ts is strong.[228] However a significant minority considered that such buyer power is weak or medium.

(224) The number of customers is smaller than in the case of NVDs as the customer base mainly consists of NVD producers. Thus the demand side consists of a few large buyers, which in general implies some buying power.

(225) However, buyer power is bound to be limited if theer are only three alternatives and this is even more the case if the number of alternatives is reduced from 3 to 2.

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221 Q1 Questionnaire to customers, question 41, Q2 Questionnaire to competitors, question 60

222 Response of B.M.A.S.R.L to Q1 Questionnaire to customers, question 41

223 Response of Italy's Land Armament Directorate to Q1 Questionnaire to customers, question 41

224 Safran's response to Q2 Questionnaire to competitors, question 33

225 Response of L.F.E. SAS to Q1 Questionnaire to customers, question 41

226 TNVC's response to Q1 Questionnaire to customers, question 41

227 Response of United Technologies Corporation to Q2 Questionnaire to competitors, question 60

228 Q1 Questionnaire to customers, question 50, Q2 Questionnaire to competitors, question 69

Further, I2T is the single most critical input to image intensification NVDs, which reduces buyer power.

(226) In addition, as discussed in Section 5.3.2.1. buyer power depends on a competitive market where the customer can play suppliers off against one another. Indeed, if competition weakens as a result of the Transaction and all suppliers submit worse bids, the customer is left with worse choices than pre-Transaction and higher prices than pre-Transaction. Thus it is unlikely that its limited buyer power will counteract these effects. This is all the more likely given that I2Ts are a critical input to NVDs.

(227) Therefore, the Commission considers that while some customers have some buyer power customers, generally customers are unable to contain the price increases resulting from the Transaction. Consequently, buyer power is unlikely to mitigate the negative effects of the Transaction.

F) Entry and expansion

(228) Respondents to the market investigation pointed to significant barriers to entry.[229] These barriers are very similar to the barriers in the case of image intensification NVDs with the difference that they appear to be even higher for I2Ts.

(229) First, any entrant needs to develop an advanced technology, which involves significant R&D spending.[230] This also involves significant amount of uncertainty since developing I2T technology is very challenging, which is shown by the fact that there are only three suppliers in the relevant market. Further, a new entrant has no order backlog to support R&D costs while it competes with incumbents that already have the technology and can support their R&D from revenues from their order backlog. This barrier appears to be higher than the same barrier in NVDs as the core technology cannot be sourced from third parties.

(230) Second, even if an entrant develops the relevant technology, the supplier has to demonstrate that the I2T works reliably in practice.[231] Indeed, this aspect is important as the tube is critical to mission performance and missions involve various, often extreme, situations and circumstances. This also involves significant development work, practical testing and requires familiarity with mission situations from the perspective of a device used, which is hard to acquire for a new entrant.

(231) Third, respondents pointed out that entry requires very substantial investments in manufacturing equipment,[232] which further increases the fixed costs that a new entrant would have to support without existing order backlog and scale.

(232) Fourth, tenders require references, which a new entrant lacks by definition. This makes it challenging to win the first contract, which in turn makes it challenging

229 Q1 Questionnaire to customers, question 47, Q2 Questionnaire to competitors, question 66

230 Theon's response to Q1 Questionnaire to customers, question 47, Responses of Elbit and Safran to to Questionnaire to competitors, question 66

231 Thales's response to Q2 Questionnaire to competitors, question 66

232 Response of Theon to Q1 Questionnaire to customers, question 47, Elbit's response to to Questionnaire to competitors, question 66

to acquire the relevant references. Breaking this negative feedback loop is a significant barrier. In addition, the breadth and quality of the portfolio of references is also valued, which further reinforces the negative feedback loop for the entrant and positive feedback loop for the incumbent.

(233) Fifth, tender procedures are costly and complex,[233] which increases the transaction costs an entrant has to support with little or no order backlog.

(234) Sixth, a new entrant has to build out a sales and repair network,[234] which increases substantially the initial investments necessary to enter. In this case too, incumbents support such fixed costs much easier than new entrants.

(235) Seventh, a majority of respondents considered that suppliers that have already supplied a customer have an advantage with that customer relative to other suppliers.[235] This is due to familiarity resulting from existing relationships, proven track record with the specific customer, or preference for a certain supplier for other reasons. Contrary to a new entrant, all incumbents enjoy this advantage to a certain extent due to their track record of deliveries.

(236) With the exception of the initial investment in manufacturing capabilities, all of these factors also make significant expansion difficult.

(237) The Commission notes that unlike in the case of image intensification NVDs (where some of these barriers would be somewhat lower for thermal NVD suppliers), in the case of I2Ts there is not a group of firms for which some of the above mentioned barriers would be lower.

(238) In addition there has not been large scale entry or expansion in the last ten years[236] and a majority of respondents do not expect large scale entry or expansion in the next 3-5 years.[237]

(239) Based on the above, the Commission considers that entry or expansion is unlikely to mitigate the effects of the Transaction.

G) Conclusion on on horizontal non-coordinatd effects as regards I2Ts

(240) For the reasons explained above, the Commission considers that the Transaction raises serious doubts as to its compatibility with the internal market in the market for I2Ts.

5.2.3. Competitive assessment – horizontal coordinated effects

5.2.3.1. Notifying Party's view

(241) The Notifying Party considers that the Transaction will not lead to coordinated effects in I2Ts exectly for the same reasons as in the case of NVDs. Namely as

233 Thales's response to Q2 Questionnaire to competitors, question 66
234 PCO S.A.'s response Q2 Questionnaire to competitors, question 66
235 Q1 Questionnaire to customers, question 46, Q2 Questionnaire to competitors, question 65
236 Q1 Questionnaire to customers, question 48, Q2 Questionnaire to competitors, question 67
237 Q1 Questionnaire to customers, question 49, Q2 Questionnaire to competitors, question 68

discussed in Section 5.1.3.1 it considers, first that the lack of product homogeneity renders implausible any implicit coordination, especially in a tender market. Second, the market is not transparent as it is to a large extent a bidding market, rendering any implicit collusion inherently unstable. Third, the market is driven by innovation given the technological features of the products. This feature too prevents the possibility of implicit and sustainable coordination for any significant period of time.

5.2.3.2. Commission's assessment

(242) The Commission agrees with the Notifying Party largely for the same reasons as in the case of NVDs (Section 5.1.3.2)

(243) I2Ts are a heterogeneous product group with vmultiple parameters (i.e. not only price but also durability, resolution, noise-to-signal ratio, range, energy consumption), which makes it difficult for competitors to implicitly reach a common understanding on the terms of coordination.

(244) Maintaining the coordination also appears difficult for several reasons. First, the market is indeed not transparent, which makes montoring the deviations from the agreed terms of coordination difficult. Second, the lumpy nature of demand incentives firms to cheat on the agreed terms. Third, it is indeed the case that the market for I2T is characterised by innovation, which renders any tactic coordination unstable.

(245) In any event, the commitments offered by the Notifying Party remove the entire overlap in the night vision space and thus the Transaction will not give rise to any horizontal coordinated effects in any NVD market.

5.3. I2Ts and NVDs – Non-horizontal effects

(246) Both Parties are active on the upstream market of I2Ts and the downstream market of image intensification NVDs, which raises the possibility of both input foreclosure and customer foreclosure.

5.3.1. Input foreclosure

5.3.1.1. Notifying Party's view

(247) The Notifying Party submits that the Transaction does not raise any vertical concerns because the combined entity, the shares of which are not exceeding [20-30]% on the relevant market, will not have either the ability or the incentive to engage in input foreclosure. More specifically, the Notifying Party considers that the combined entity will not be able to engage in input foreclosure (i.e., restricting competitors' access to I2Ts) because it lacks the market power to do so. The Parties' combined 2018 EEA market share for I2Ts amounts to no more than [20-30]%. Any supplier of NVDs will be able to easily source I2Ts from Photonis. In addition, the Transaction does not bring about any incentive to engage in input foreclosure. Photonis, which is not present on the downstream market for NVDs, would use any attempt at input foreclosure by the Parties to expand its market position upstream.

5.3.1.2. Commission's assessment

(248) The Commission notes that, as discussed in Section 8.2.2. B), using the correct methodology, the combined entity's market share is [20-30]%. According to the Non-Horizontal Merger Guidelines, non-horizontal concersn are unlikely, where the market share post-merger of the new entity in each of the market concerned is below 30 % and the post-merger HHI is below 2 000.[238] Thus although [20-30]% is below one of the usual indicative thresholds, the post-merger HHI of [6000-7000] is significantly above 2000. Thus it is not the case that input foreclosure concerns cannot arise on account of the lack of market power. Indeed, the very concentrated nature of the upstream market does in fact result in a situation where an input foreclosure strategy could be both feasible and profitable. That is to say the merged entity is likely to have both the ability and the incentive to engage in such a strategy.

(249) This is because the merged entity is certainly able to raise input prices or decide not to deal with downstream NVD competitors. If it did so, the only other option for the NVD suppliers would be Photonis, which would give significant pricing power to Photonis as the latter would be the sole remaining supplier. This in turn could lead to significant price increases downstream, such that the overall impact of the strategy on the merged entity could be positive. This in turn implies that the merged entity would also have the incentive to engage in this strategy.

(250) Thus, the Commission considers that the Transaction raises serious doubts as to its compatibility with the internal market on the basis of non-horizontal effects, more precisely input foreclosure, in relation to I2Ts and image intensification NVDs.

5.3.2. Customer foreclosure

5.3.2.1. Notifying Party's view

(251) The Notifying Party submits that the Transaction does not give rise to any customer foreclosure risks. Both Parties are already vertically integrated and, therefore, the Transaction does not in practice remove any customer base for tube suppliers. Neither Party purchases any I2Ts from third parties. In any event, the Parties' 2018 combined EEA shares for all NVDs is [10-20]%, meaning that a significant portion of the downstream customer base remains accessible for suppliers of I2Ts.

5.3.2.2. Commission's assessment

(252) The Commission agrees with the Notifying Party. Although, as discussed in Section 7.2.2.2 B), based on the correct methodology the combined market share of the Parties is [30-40]% on the downstream market of image intensification NVDs both Parties self-supply I2Ts and thus the Transaction would not remove any customer from the sole remaining supplier, Photonis.

[238] Non-Horizontal Merger Guidelines paragraph 25

(253) Consequently, the Commission considers that the Transaction does not lead to serious doubts as to its compatibility with the common market on account of customer foreclosure.

5.3.3. Conglomarate concerns within NVDs and I2Ts

5.3.3.1. Notifying Party's view

(254) The Notifying Party considers that the combined entity would not have the ability or incentive to foreclose its rivals by tying or bundling.[239] Tenders do not tend to cover a broad range of products, but are narrow in scope and product-specific. Thus a bundling strategy would not be profitable. In addition, the range of products in the combined entity's portfolio is matched by a number of competitors.

5.3.3.2. Commission's assessment

(255) The Commission agrees with the Notifying Party. I2Ts and image intensification NVDs are unlikely to be bundled as they are in an upstream downstream relationship. Within NVDs, the discussion on demand substitution (Section 5.1.1.1.D(a)) showed that tenders are indeed narrow in scope and product-specific, which was the reason why generally there was no demand substitution across the different segmentations. It follows that a bundling strategy is unlikely to be feasible or profitable. Further, in each segment where the merged entity would have some market power (image intensification NVDs, fusion NVDs) there are competitors such as Thales and Elbit that also have a wide product range and can produce similar bundles.

(256) In any event, the commitments offered by the Notifying Party remove the entire overlap in the night vision space and thus the Transaction will not give rise to any conglomerate effects in relation to I2Ts or any NVD market.

5.4. Hand held video data links

5.4.1. Market definition

5.4.1.1. Product market definition

A) Introduction

(257) Hand Held Video Data Links ('HH-VDLs') fall into wider category of tactical communication devices, which are essentially products that provide secure telecommunications to soldiers in the battlefield or in areas in proximity to combat (so called forward areas).[240] Tactical communication must have a low probability of detection and interception by a third party. Tactical communication devices transmit communications between users of the device using waveforms.[241] Waveforms are a type of transmission mode that operate over a specific range of radio frequencies and use various encryption and decryption

[239] Form CO, paragraph 263
[240] Form CO, paragraph 310
[241] Form CO, paragraph 311

solutions. There are many different types of waveforms and each type has its advantages and disadvantages. For example, a specific waveform can transmit data at high rates but may be limited in its geographical range. Thus the choice of waveform in a particular device will depend on factors such as such as, for example, distance to the intended recipient (e.g., ground-to-ground, air-to-ground, and beyond-line-of-sight) or bandwidth requirements (e.g., narrowband communications suitable for voice communication or high bandwidth communication suitable for transmission of data intensive video images).

(258) HH-VDLs were developed for air-to-ground high-bandwidth communications such as streaming video and are typically used in Intelligence, Surveillance, and Reconnaissance ('ISR') missions.[242] HH-VDLs enable the transmission of high-bandwidth, real-time full motion video from aircraft, including drones, to soldiers on the ground.[243] Full motion video in this sense is digital video data that is transmitted for real time reproduction on a multimedia system at a rate of no less than 25 frames per second. HH-VDLs allow for a faster and more widely disseminated ISR information than previous technologies, i.e. more soldiers can get ISR data directly whereas previously a satellite had to receive the information and then disseminate it to a soldier with a device capable of receiving and displaying satellite-transmitted video.[244]

(259) HH-VDLs are just one among the many tactical communication products, which include air-to ground hand held devices using narrow bandwidth suitable for voice transmission; ground-to-ground and satellite-to-ground hand held devices; manpack radios; radios fixed to vehicles such as naval, air and ground forces platforms (tanks, airplanes, helicopters, ships, jeeps etc); fixed systems; tactical communication networks and embedded high-grade encryption solutions. The Parties overlap only in HH-VDLs.[245]

B) Notifying Party's view

(260) The Notifying Party considers that the relevant product market for the purpose of assessing the Transaction is the market for HH-VDLs.[246] However, the Notifying Party submits that the precise product market definition can be left open as the Transaction raises no competition concerns even under the most narrow market definition, being that of HH-VDLs.[247]

(261) The Notifying Party refers to the Commission's precedent *EADS*,[248] in which the Commission assessed secure radio communications systems used by armed forces and distinguished three separate markets for (i) mobile systems (carried by troops), (ii) transportable systems (carried by military vehicles), and (iii) fixed systems.[249] However, the Notifying Party submits that the EADS precedent is too old and keeping the markets defined there without further distinctions would lead

242 Form CO, paragraph 313
243 Form CO, paragraph 313
244 Form CO, paragraph 315
245 Form CO, paragraph 308
246 Form CO, paragraph 336
247 Form CO, paragraph 340
248 Case M.1745 EADS, Commission decision of May 11, 2000.
249 Case M.1745 EADS, Commission decision of May 11, 2000, paragraph 202

to markets that are too wide.[250] For example, systems carried by troops would include hand held as well as much larger devices that cannot be hand held (e.g. transceivers), although these are clearly not interchangeable from the point of view of troops. [251]

(262) The Notifying Party submits that even within hand held devices, Harris' ground radios never competed with L3's HH-VDLs (i.e. they are not demand-susbtitutable) and while some ground radio suppliers entered the HH-VDL space such entry requires time and efforts that are not compatible with supply-side side substitution with the meaning of the Commission's Notice on the definition of the relevant market.[252]

(263) Indeed, even this market (i.e. hand held communication devices) would encompass very different devices which are not substitutable for end-users (troops). This is because such devices operate on different waveforms which notably limit (i) the type of communications (e.g., ground-to-ground, air-to-ground, and beyond-line-of-sight satellite) and (ii) the type of information transmitted and/or bandwidth requirements (for instance, narrowband voice or data communications versus high-bandwidth data such as full motion video).[253]

C) Commission's decisional practice

(264) The Commission has not previously addressed HH-VDLs as such in its decisional practice. However, as the Notifying Party mentioned, in *EADS*,[254] the Commission assessed secure telecommunications and secure radio communications systems used by armed forces and distingushed three separate markets for (i) mobile systems (carried by military personnel), (ii) transportable systems (carried by military vehicles), and (iii) fixed systems (i.e. non-transportable communication systems).[255]

(265) The Commission also considered previously military communication systems based on functionality, the platform type (ground, air, sea), and the force for which they are intended (i.e. air forces, ground forces and naval forces).[256] Namely, in the 2005 *Finmeccania* decisions, referring to the *Alcatel*[257] precedent the Commission distinguished between communication systems used by ground forces and communications systems used by naval forces. [258] In these decisions the Commission noted that the market investigation confirmed the distinction based on the platform type (ground, sea, air) or based on the force for which they are intended (i.e. naval, ground and air forces) and that respondents also argued

[250] Form CO, paragraphs 327-335

[251] Form CO, paragraph 334

[252] Form CO, paragraphs 328 and 331

[253] Form CO, paragraph 329

[254] Case M.1745 EADS, Commission decision of May 11, 2000.

[255] Case M.1745 EADS, Commission decision of May 11, 2000, paragraph 202.

[256] Case M.3649 Finmeccanica / Baes Avionics & Communications, Commission decision of March 14, 2005, paragraphs 12-15; and Case M.3735 Finmeccanica / AMS, Commission decision of March 14, 2005, paragraphs 12-15.

[257] Case M.1121 Alcatel / Thomson SA Thomson CSF

[258] Case M.3649 Finmeccania / Baes Avionics & Communications, Commission decision of March 14, 2005.

for narrower segmentations with regard to some equipment. However, the Commission ultimately left the market definition open.

D) Commission's assessment

(266) The Commission will consider a number of distinctions mentioned by the Notifying Party in the Form CO and the precedents. Below the Commission will discuss the possible distinctions as follows:

i. Distinction between tactical and non-tactical communication equipment;

ii. Within tactical communication equipment, distncton between land, sea and air communication equipment, i.e. equipment used by ground, naval and air forces;

iii. within tactical communication equipment used by ground forces, distinction between devices carried by military personnel, platforms and fixed equipment;

iv. within devices carried by military personnel (tactical communication, ground forces) distinction between hand held devices and other devices;

v. within hand held devices (tactical communication, ground forces, devices carried by military personnel), distinction between devices for ground-to-air, air-to-ground and satellite-to-ground communication; and

vi. within air-to-ground devices (tactical communication, ground forces, devices carried by troops, handheld devices) between low and high bandwidth capabilities.

(267) Additional distinctions, e.g. those within tactical equipment used by naval forces, or within tactical equipment used by ground forces and carried by platforms etc. are not of interest as in those segments there is no overlap between the Parties in the EEA.

(268) Following the same approach as in the case of NVDs Section 5.1.1., the Commission will first consider demand substitutability, to be followed by supply-side assessment.

(269) As a preliminary remark the Commission notes that the responses on demand side substitution show a similar pattern across all distinctions. Namely, similar to NVDs (Section 5.1.1.1(D)), it appears that there is no demand-side substitution across the distinctions mentioned, in particular because the devices in the different categories have different intended uses or very different performance metrics on different parameters, which in turn leads to different uses. Further, customers always appear to specify in detail in their tenders the devices sought, which implies that only devices complying with those specifications are compliant offers and devices with different specifications are not substitutable from a demand perspective. This again reflecs the fact that in bidding markets for specialized goods, as is the case for HH-VDLs, the tenders (i.e. the demand side) are often highly specific such that the different but related products are not eligible. As a result, the market definition tends to turn on supply-side side considerations, such as, for example, the ability of suppliers to adjust their

production to meet the various tender specifications or to produce the related product.

(a) Demand side substitution

a.i) Distinction between tactical communication and non-tactical communication devices and systems

(270) Tactical communication devices systems are used by the military to provide secure communications to soldiers in the battlefield or in areas in proximity to combat (so called forward areas).[259] Tactical communications is usually contrasted with strategic communications, which are backhaul communications that form the backbone communications infrastructure and consist of predominantly stationary assets.

(271) None of the competitors considered that tactical communication devices/systems and non-tactical (strategic) communication devices/systems would be interchangeable.[260] Safran indicated that tactical and non-tactical communication devices must comply with different operational patterns and requirements such as COMSEC (communication security) performance levels, while Leonardo noted that they have different functional and operational requirements and costs.[261] Thales considered that there is no interchangeability due to at least five different factors, including i) frequency band, bandwidth and related waveform; ii) security and encryption (NATO and other national security restrictions); iii) Dedicated standards; iv) System integration on a platform (soldier, vehicle, shelter); and v) operational mission requirements such as range, autonomy etc.[262]

(272) A large majority of customers also considered that tactical and non-tactical communication systems are not interchangeable as the two types of device have different uses and different performance levels.[263]

(273) The Comission therefore considers that there is no demand substitution across tactical and non-tactical communication systems and devices. From a demand side perspective, a further sub-segmentation of communication devices depending on their tactical/non-tactical characteristics is therefore possible. However, for the purpose of this decision, it can be left open as the Transaction would not raise serious doubts as to its compatibility with the internal market under any plausible market definition.

a.ii) Distinction between land, sea and air communication systems and devices (within tactical communications)

(274) As noted above in Section 5.4.1.C, in the *Finmeccania* cases the Commission drew a distinction between military communication systems based on the platform (ground, air, sea) and the force for which they are intended (e.g., ground forces, navy, air forces), but without concluding that separate markets existed.

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[259] Form CO, paragraph 310

[260] Response to Q2 questionnaire to competitors (II), question 3.

[261] Responses of Safran and Leonardo to Q2 questionnaire to competitors (II), question 3

[262] Thales's response to Q2 questionnaire to competitors (II), question 3.

[263] Responses to Q1 questionnaire to customers, question 53

(275) A large majority of customers and competitors confirmed that communication equipment used by different military forces (i.e., land, sea and air) is not interchangeable.[264] United Technologies Corporation considered that the communication needs and equipment specifications are different in each domain (land, air, sea),[265] while WB Electronics pointed out that communication equipment used by naval forces require extended ranges and thus transmission power.[266] Safran emphasized that land, sea and air communication systems must comply, with different operational patterns and requirements.[267] Thales referred to the same factors as in the case of the distinction between tactical and non-tactical communication equipment, i.e. differences in frequency band, encryption, standards, platform integration and operational mission requirements (range, autonomy).[268] Thus, in Thales's opinion there is significant variance in these factors not only between tactical and non-tactical communication equipment but also between equipment used by ground, naval and air forces. B.M.A.S.R.L submitted that the different forces use different applications and the devices need to meet different performance levels.[269]

(276) The Commission therefore considers that there is no demand-side substitutability across tactical communication devices and systems used by different forces (ground, naval and air forces). From a demand side perspective, a further sub-segmentation of tactical communication devices depending on the use by different forces is therefore possible. However, for the purpose of this decision, it can be left open as the Transaction would not raise serious doubts as to its compatibility with the internal market under any plausible market definition.

a.iii) Distinction between devices carried by military personnel, platforms and fixed equipment

(277) As noted above in Section 5.4.1.C, in the EADS case the Commission assessed telecommunications and secure radio communications systems used by armed forces and considered three separate segments, namely (i) mobile systems (carried by troops); (ii) transportable systems (carried by military vehicles); and (iii) fixed systems.

(278) A majority of respondents considered that this distinction remains relevant today[270] and a very large majority considerd that the distinction is relevant specifically witing tactical communication used by ground forces.[271] For example, Italy's Land Armament Directorate considered that mobile, transportable and fixed equipment are very different applications with different costs and

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264 Responses to Q1 questionnaire to customers, question 52, Q2 questionnaire to competitors (II), question 1

265 Response of United Technology Corporation to Q2 questionnaire to competitors (II), question 1

266 Response of WB Electronics to Q2 questionnaire to competitors (II), question 1

267 Safran's response to Q2 questionnaire to competitors (II), question 1

268 Thales's response to Q2 questionnaire to competitors (II), question 1

269 Response of B.M.A.S.R.L to Q1 questionnaire to customers, question 52

270 Responses to Q1 questionnaire to customers, question 54.1 and Q2 questionnaire to competitors (II), question 5.1

271 Responses to Q1 questionnaire to customers, question 54.2 and Q2 questionnaire to competitors (II), question 5.2 Q2 questionnaire to competitors (II), question 5.2

constraints.[272] Safran considered that the segmentation applies, even if interoperability needs to be ensured between mobile and transportable systems.[273]

(279) Furthermore, the market feedback shows that the weight and size of tactical communication equipment is important to its demand-side substitutability – as discussed in Section 5.4.1.1.D.a.iv) below, even within the category of equipment carried by troops, hand held devices are not considered substitutable from a demand perspective with larger devices such as manpack radios.[274] This is consistent with the market feedback on the distinction between mobile, transportable and fixed systems and thus confirms that there is no reason to depart from the precedent although the categories of mobile, transportable and fixed systems can be subject to further distinctions.

(280) Thus the Commission considers that within tactical communication systems used by ground forces, there is no demand-side substitutability between mobile (carried by troops), transportable (carried by vehicle) and fixed systems. From a demand side perspective, a further sub-segmentation of tactical communication devices by ground forces into mobile, transportable and fixed systems is therefore possible. However, for the purpose of this decision, it can be left open as the Transaction would not raise serious doubts as to its compatibility with the internal market under any plausible market definition.

a.iv) Distinction between hand held and other devices

(281) As already mentioned in 5.4.1.1.D.a.v) above, the market feedback clearly indicated that within the category of equipment carried by troops hand held devices are not considered substitutable from a demand perspective with larger devices such as manpack radios.[275] Indeed it appers that a combat troop's mobility and fighting capacity would be significantly reduced if he had to carry a large manpack radio. As both Thales and Safran noted, there is a trade-off between hand held and manpack radios: hand held radios are small, light and use little energy but their range and performance is limited, whereas the opposite applies to manpack radios in that they are more powerful and longer range at the expense of being heavy and requiring more energy.[276] Leonardo made essentially the same point "*Handheld and manportable are not considered interchangeable in the usual operational scenarios, because of their different SWaP (size weight and power) and communication functionalities*."[277] as did United Corporation Technologies: "*The capability requirements for a handheld versus a larger device such as manpack is different due to the support of multiple communication channels and the distance of communication needed which increases the complexity, power and the size of the radio*."[278] This trade-off results in different intended uses as combat troops cannot use manpack radios whereas

[272] Response of Italy's Land Aramament Directorate to Q1 questionnaire to customers, question 54.1

[273] Safran's response to

[274] Responses to Q1 questionnaire to customers, question 55 and Q2 questionnaire to competitors (II) question 6

[275] Responses to Q1 questionnaire to customers, question 55 and Q2 questionnaire to competitors (II) question 6

[276] Safran's and Thales's responses to Q1 questionnaire to customers, question 55

[277] Leonardo's response to Q2 questionnaire to competitors (II) question 6

[278] Response of United Corporation Technologies to Q2 questionnaire to competitors (II) question 6

communication personnel cannot use hand held radios for long range communication.

(282) Based on the above, the Commission considers that within the category of communication systems carried by troops (tactical communication, ground forces) there is no demand substitution between hand held devices and larger devices such as manpack radios. From a demand side perspective, a further sub-segmentation of communication systems carried by troops into hand held devices and larger devices such as manpack radios is therefore possible. However, for the purpose of this decision, it can be left open as the Transaction would not raise serious doubts as to its compatibility with the internal market under any plausible market definition.

a.v) Distinction based on sender/receiver type - ground-to-air, air-to-ground and satellite-to-ground devices

(283) Virtually all respondents to the market investigation considered that within hand hand held devices (tactical communication, ground forces, devices carried by troops) devices that communicate air-to-ground, ground-to-ground and beyond line-of-sight satellite to ground are not interchangeable.[279] Italy's Land Armament Directorate considered that these devices are used in different tactical scenarios and hence they are not interchangeable.[280] Safran submitted that "*Such communication devices must comply with different operational use cases, performance levels relating to the range, waveform, modulation, etc.*"[281] Leonardo explained that "*Air-ground (ground based) and beyond line of site hand held radios are dedicated equipment with high complexity and high-grade security requirements and consequent at high cost. Ground to ground radios are more massively distributed to the soldiers/riflemen, thus have a significantly lower price."*[282] Thales highlighted that these devices incorporate different functions.[283]

(284) Moreover, the market feedback shows that customers typically include in their tender specifications the type of sender / receiver for the tactical handheld communication device requested (i.e., whether it should be air-to-ground, ground-to-ground etc.).[284] As discussed in Section 5.1.1.1, this ipso facto excludes demand-side substitution as a ground-to-ground device will not be accepted in a tender seeking air-to-ground devices.

(285) Thus the Commission considers that within hand hand held devices (tactical communication, ground forces, devices carried by troops), air-to-ground, ground-to-ground and beyond line-of-sight satellite-to-ground devices are not demand-

279 Responses to Q1 questionnaire to customers, question 56 and Q2 questionnaire to competitors (II), question 8

280 Response of Italy's Land Armament Directoarte to Q1 questionnaire to customers, question 56

281 Safran's response to Q2 questionnaire to competitors (II), question 8

282 Leonardo's response to Q2 questionnaire to competitors (II), question 8. Leonardo also noted that the waveform could be changed by changing the software but that this does not result substitutability from an operational point of view

283 Thales's response to response to Q2 questionnaire to competitors (II), question 8

284 Reponses to Q1 questionnaire to customers, question 57 and Q2 questionnaire to competitors (II), question 9.

substitutable. From a demand side perspective, a further sub-segmentation of hand held devices into air-to-ground, ground-to-ground and beyond line-of-sight satellite to ground devices is therefore possible. However, for the purpose of this decision, it can be left open as the Transaction would not raise serious doubts as to its compatibility with the internal market under any plausible market definition.

a.vi) Distinction between low and high bandwidth capabilities

(286) The market feedback was unanimous that within hand held air-to-ground devices (tactical communication, ground forces, devices carried by troops), there is no interchageablity between devices based on data bandwidth, i.e. between devices designed for narrowband communications (permitting the exchange of voice, text and low quality images) and those designed for high bandwidth data communications (permitting the exchange of full motion video and high quality images).[285]

(287) Respondents pointed out that the two types of devices use different waveforms and modulation solutions and thus occupy different frequencies.[286] Further, the narrowband and wideband features are required for different operational scenarios,[287] which excludes interchangeability. In addition, respondents submitted that narrowband and highbandwith devices require different software and hardware capabilities.[288]

(288) Respondents also confirmed with near uninamity that high and low bandwidth devices are rarely in competition with each other having regard to the difference of users (e.g. special forces or ordinary troops) and the difference in costs and functionalities.[289]

(289) Thus the Commission considers that within the category of hand held air-to-ground devices ((tactical communication, ground forces, devices carried by troops) there is no demand substation across high and low bandwidth devices i.e. across devices capable of transmitting only voice, text and low quality image and devices capable of transmitting full motion video and high quality images. In other words, HH-VDLs (high bandwidth, air-to-ground devices) are not substitutable from a demand perspective neither with low bandwidth hand held devices, nor with ground-to-ground or satellite-to-ground hand held devices. From a demand side perspective, a further sub-segmentation of hand held air-to-ground devices depending on the bandwidth is therefore possible. However, for the purpose of this decision, it can be left open as the Transaction would not raise serious doubts as to its compatibility with the internal market under any plausible market definition.

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285 Reponses to Q1 questionnaire to customers, question 58 and Q2 questionnaire to competitors (II), question 11

286 Thales's and Safran's responses to Q1 questionnaire to customers, question 58

287 Leonardo's response to Q2 questionnaire to competitors (II), question 11

288 Response of United Technologies Coroporation to Q2 questionnaire to competitors (II), question 11

289 Reponses to Q1 questionnaire to customers, question 59 and Q2 questionnaire to competitors (II), question 12

(b) Supply side substitution

b.i) Distinction between tactical communication and non-tactical communication devices and systems

(290) From a supply side perspective, a majority of competitors was of the view that that switching production between tactical and non-tactical communications systems would imply significant technical difficulties.[290]

(291) As United Technologies Corporation explained "*due to the constraints and security requirement differences between these communication devices/systems, switching production from tactical to non-tactical would require a different manufacturing process and know-know especially from a security and exportability aspect and military versus commercial use."*[291] It was also mentioned that manufacturing assets are very different even if the technologies are similar.[292]

(292) These views appear to be in line with the fact that tactical and non-tactical communication devices have different costs, use different frequency bands, waveforms, encryption and standards.[293] Especially the different costs and the different technologies (standards, encryption) suggest different production processes and know-how.

(293) Based on the above feedback it is highly unlikely that a supplier without any experience in manufacturing tactical communication equipment could swiftly start to produce tactical equipment in response to a tender without significant investments. Thus the Commission considers that there is no supply-side substitution between tactical and non-tactical communication devices and systems. However, for the purpose of this decision, it can be left open as the Transaction would not raise serious doubts as to its compatibility with the internal market under any plausible market definition.

b.ii) Distinction between land, sea and air communication systems and devices

(294) The market feedback shows that switching production between the manufacture of communication devices for ground, for naval and for air force communications would imply significant technical difficulties and/or costs. No respondents considered that the switch could be made without incurring significant technical difficulties and/or costs.[294]

(295) Safran submitted that "*Waveforms can differ from one environment to another (for example ground to ground communications are not the same as ground to air). Therefore, this would need specific production capacities and additional cost, as well as different system integration needs to take into account*."[295] Thales considered that "*Requirements for each domain in terms of performance,*

[290] Response to Q2 questionnaire to competitors (II), question 4

[291] Response to United Technologies Corporation Response to Q2 questionnaire to competitors (II), question 4

[292] Leonardo's response to Response to Q2 questionnaire to competitors (II), question 4

[293] See Section Section 7.1.1.4 a)

[294] Responses to Q2 questionnaire to competitors (II), question 2

[295] Safran's response to Q2 questionnaire to competitors (II), question 2

compactness, components, certification, can impact significantly the manufacturing process and tools depending on the domain, in particular for aero products"[296] United Technologies Corporation submitted that "*The manufacturing process and know-how required to manufacture communication devices is dependent on which domain (ground, sea or air) they operate from as they differ based on the type of platforms (e.g. ship, aircraft, land vehicle) to be integrated on and communication requirements (e.g. distance, power, latency) vary due to domain differences*."[297]

(296) These responses indicate significate differences in the relevant production processes, which are unlikely to be overcome within a short period of time and at little or no cost.

(297) Consequently the Commission considers that there is no supply-side substitution across tactical communication devices and used by ground, naval and air forces. However, for the purpose of this decision, it can be left open as the Transaction would not raise serious doubts as to its compatibility with the internal market under any plausible market definition.

b.iii) Distinction between devices carried by military personnel, platforms and fixed equipment

(298) As exlplained in Section 5.4.1.1.D(a), respondents to the market investigation considered that the Commission precedent establishing the distinction between mobile systems (carried by troops), transportable systems (carried by military vehicles) and fixed systems (*EADS*,[298]) is still valid. This also implies that within the category of tactical communication devices used by ground forces there is no supply-side substitution across mobile, transportable and fixed systems.

(299) Further, competitors also confirmed that even within mobile systems (carried by troops), switching production between hand held devices and larger and heavier devices such as manpack radios would imply siginifcant difficulties and costs.[299] It follows that switching production between products that are much more divergent in size, weight, performance and specifications also cannot be done swiftly and with minimal costs and especially no sunk costs.

(300) Thus the Commission considers that within the category of tactical communication devices used by ground forces there is no supply-side substitution across mobile, transportable and fixed systems. However, for the purpose of this decision, it can be left open as the Transaction would not raise serious doubts as to its compatibility with the internal market under any plausible market definition.

b.iv) Distinction between hand held devices and other devices

(301) As already discussed in Section 5.4.1.1(b.iii), competitors considered that switching production between hand held devices and larger and heavier devices such as manpack radios would imply siginifcant difficulties and costs.

296 Thales's response to Q2 questionnaire to competitors (II), question 2

297 Response of United Technologies Corporation to Q2 questionnaire to competitors (II), question 2

298 Case M.1745 EADS, Commission decision of May 11, 2000.

299 Responses to Q2 questionnaire to competitors (II), question 7

(302) Leonardo explained that "*Manufacturing processes of the two types of equipment are usually different*."[300] Safran considered that "*This would indeed imply significant technical difficulties and additional costs."*[301] This was echoed by United Technologies Corporation.[302]

(303) Consequently, the Commission considers that within within the category of commincation systems carried by military personnel (tactical communication, ground forces) there is no supply substitution between hand held devices and larger devices such as manpack radios.

b.v) Distinction based on sender/receiver type (ground-to-air, air-to-ground and satellite-to-ground devices)

(304) The majority of competitors considered that switching production would imply significant technical difficulties and/or costs.[303] Safran considered that switching would imply significant difficulties and costs while United Technologies Corporation submitted that the know-how and the manufacturing processes are different.[304]

(305) These views appear to be in line with the fact that these devices have different performance levels and different complexity (air-to-ground and satellite to ground being signficiantly more complex than ground-to-ground)[305]

(306) Further, there are differences in the supplier landscape as well. For example, as discussed in Section 5.4.2.2. Harris is the market leader in ground-to-ground radios and L3 is not present in this segment. By contrast in HH-VDLs, which is an air-to-ground device L3 is the market leader and Harris has minimal presence. Different market strength in different segments also indicates that suppliers cannot switch effortlessly between these segments.

(307) Thus the Commission considers that within hand hand held devices (tactical communication, ground forces, devices carried by troops), air-to-ground, ground-to-ground and beyond line-of-sight satellite to ground devices are not supply-substitutable. However, for the purpose of this decision, it can be left open as the Transaction would not raise serious doubts as to its compatibility with the internal market under any plausible market definition.

b.vi) Distinction between low and high bandwidth devices

(308) As regards the distinction between high and low bandwidth devices (within air to ground hand held devices - tactical communication, ground forces, devices carried by troops) from a supply perspective, responses were mixed. Safran considered that switching the production between these device types would

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300 Leonardo's response to Q2 questionnaire to competitors (II), question 7

301 Safran's response to Q2 questionnaire to competitors (II), question 7

302 Response of United Technologies Coroporation to Q2 questionnaire to competitors (II), question 7

303 Reponses to Q2 questionnaire to competitors (II), question 10

304 Responses of Safran and United Technologies Corporation to Q2 questionnaire to competitors (II), question 10

305 See Section 5.4.4.1.(a.v)

involve significant time and costs,[306] while Thales and United Technologies Coproration considered that the production process and know-how is similar for both types.[307] Leonardo was of the view that "*Manufacturing is not strictly different, but the development and the basic know how at the basis of it is largely different. Please also consider that, for instance, also in the case of some radio components to be used in the production there are differences (e.g. in terms of bandwidth management capability)*."[308]

(309) As the results of the market investigation are inconclusive, the Commission leaves the question open. However, this does not affect the competitive assessment as the Transaction does not raise serious doubts regardless of this distinction.

(c) Conclusion on product market definition

(310) Based on the above the Commission considers that, while many possible distinctions may exist, for the purpose of this decision there is no need to conclude on any of those possible distinctions given that the Parties' activities only overlap in the possible market for (i) HH-VDLs; and (ii) hand held tactical air-to-ground communication devices used by ground forces (hereinafter these will be referred to as "HH A2G" devices) and the Transaction does not give rise to serious doubts as to its compatibility with the internal market in these markets.

5.4.1.2. Geographic market definition

A) Notifying Party's view

(311) The Notifying Party considers that the relevant geographic market is at least EEA-wide, for the similar reasons as in the case of NVDs. First, it points out that HH-VDLs have a very low transport-cost-to-price ratio and Harris, L3, and their competitors sell HH-VDLs across the EEA irrespective of the location of the production facilities. Second, it submits that EEA customers rarely if ever source their HH-VDLs on a national basis. Third, the Notifying Party considers that there are no regulatory or national security restrictions preventing a suppliers present in one EEA country from being active throughout the EEA. Just like in the case of NVDs the Notifying Party notes that certain tenders de facto eliminate US suppliers such as the Parties, as they require suppliers not to be subject to ITAR. To the extent any tender within the EEA would be limited to national or European producers only, then neither L3 nor Harris would be able to participate, entailing that the Transaction is neutral with respect to any such tenders.

306 Safran's response to Q2 questionnaire to competitors (II), question 14

307 Responses of Thales and United technologies corporation to Q2 questionnaire to competitors (II), question 14

308 Leonardo's response to Q2 questionnaire to competitors (II), question 14

B) Commission's decisional practice

(312) The Commission previously found that the markets for secure communications are national in scope, even though it noted a certain development towards an EEA-wide market, resulting from common defence programs and alliances.[309]

C) The Commission's assessment

(313) The results of the market investigation were similar to the results for NVDs and thus broadly confirmed the views put forward by the Notifying Party.

(314) A large majority of customers and competitors agreed that HH-VDLs used in different Member States are not significantly different in terms of customer preference, technical specifications, and regulatory requirements such that HH-VDLs intended for one Member State can be used in another Member State.[310] Italy's Land Armament Directorate explained that there are very few producers of HH-VDL and the devices are broadly comparable.[311] Thales submitted that "*HH-VDLs from any EEA country can be used in any EEA country*."[312] While Safran mentioned that certain national specififcities exist, it considered that HH-VDLs are not significantly different across the EEA as a common body of requirements apply. [313]

(315) Moreover, United Technologies Corporation also was of the view that HH-VDLs are not significantly different across the EEA and while it raised that there can be certain "*tailoring requirements that vary country to country*", the same suppliers bid in all EEA countries and these suppliers address these specific security related requirements.[314] This suggests that to the extent there are some demand differences, suppliers can adjust their products to meet these specific requirements with relative ease.

(316) The respondents confirmed that their responses apply not only to HH-VDLs but also to the product market encompassing all air-to-ground hand held devices regardless of data bandwidth.[315]

(317) Competitors also confirmed that the same competitors are active in all EEA Member States,[316] (with regard to both alternative product markets, i.e. HH-VDLs and hand held air-to-ground devices[317] regardless of data bandwidth) which suggests that the supply landscape is similar across the EEA.

(318) A majority of the respondents considered that, there are no regulatory or national security restrictions that would prevent suppliers of HH-VDLs active in one EEA

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309 Case M.1745 EADS, Commission decision of May 11, 2000, para. 204.

310 Q1 Questionnaire to customers, question 64, Q2 Questionnaire to competitors (II), question 20

311 Response of Italy's Land Armament Directorate to Q1 Questionnaire to customers, question 64

312 Thales's response to Q2 Questionnaire to competitors (II), question 20

313 Safran's response to Q2 Questionnaire to competitors (II), question 20

314 Response of United Technologies Corporation to Q2 Questionnaire to competitors (II), question 20

315 Q1 Questionnaire to customers, question 64.2, Q2 Questionnaire to competitors (II), question 20.3

316 Q2 Questionnaire to competitors (II), question 21

317 Outside the product definition section the term "hand held air-to-ground devices" is a shorthand for hand held air-to-ground devices within the larger group of tactical communication devices used by ground forces, devices carried by troops.

Member State from being active in another EEA Member State.[318] L.F.E. SAS mentioned that there are "*No restrictions for NATO"*[319], while Bristol trust submitted that the market for HH-VDLs is an "*open market*".[320] Italy's Land Armament Directorate mentioned that "*No, the the HH-VDLs procured by Italian MoD are compliant with some of international military and/or civilian standards*"[321]. Thales submitted that "*Despite normal export control rules, there are no regulatory or national security restrictions which prevents a European supplier from supplying different EU Member States*."[322] Respondents confirmed that their responses apply not only to HH-VDLs but also to the product market encompassing all air-to-ground hand held devices regardless of data bandwidth.[323]

(319) Some exceptions mentioned. First, US Type 1 cryptography capable devices can only be sold, including within the EEA, only with the approval of the US government. Such equipment is used sometimes by certain Member States, for example the United Kingdom. This has the effect that in some cases US type 1 cryptography is required in the United Kingdom, which then excludes some European suppliers as they lack access to that technology.[324] However, the effect of this exception is limited in scope (concerns only the United Kingdom and only in certain tenders)

(320) Second, ITAR was mentioned in this respect as a regulatory restriction that prevents US companies from being active in certain EEA tenders. In this regard the Commission agrees with the Notifying Party that such restriction results in a de facto exclusion of US suppliers in EEA tenders. This would normally justify separating an ITAR market (firms active in the EEA without US suppliers) and a non-ITAR market (all suppliers active in the EEA) but in the current case this is not important as both Parties are subject to ITAR.

(321) Therefore, on the basis of the above, the market for HH-VDLs and for HH A2Gs appears to be at least EEA-wide.

(322) As regards a larger than EEA-market, several respondents mentioned restrictions stemming from NATO membership. Safran considered that competition is "*Unrestricted among NATO countries*",[325] while Thales submitted that "*NATO security restrictions prevent non NATO country's supplier to compete in NATO countries market* "[326] Similarly, United Technologies Corporation also submitted that NATO security restrictions based on NATO standards for crypto and waveform interoperability can preclude suppliers from outside the EEA/NATO from being active in tenders in the EEA.[327]

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318 Q1 Questionnaire to customers, question 65, Q2 Questionnaire to competitors (II), question 22

319 Response of L.F.E. SAS to Q1 Questionnaire to customers, question 65

320 Response of Bristol Trust to Q1 Questionnaire to customers, question 65

321 Response of Italy's Land Armament Directorate to Q1 Questionnaire to customers, question 65

322 Thales's response to Q1 Questionnaire to customers, question 65

323 Q1 Questionnaire to customers, question 65.2, Q2 Questionnaire to competitors (II), question 22.2

324 Thales's response to Q1 Questionnaire to customers, question 65

325 Safran's response to Q1 Questionnaire to customers, question 66

326 Thales's response to Q1 Questionnaire to customers, question 66

327 Response to United Technologies Corporation to Q2 Questionnaire to competitors (II), question 23

(323) Indeed, just like in the case of NVDs the Commission considers that firms that supply the militiaries non-NATO or non-NATO ally militaries (Russia, China, India) cannot be considered constraints in NATO and NATO-ally countries, including the EEA. Thus the geographic market cannot be larger than NATO and NATO ally countries. On the other hand the responses indicate that the market could also be larger than EEA or, alternatively, the market is EEA-wide but constraints outside the EEA but within the bloc of NATO and NATO ally countries need to be acknowledged. The presence of the Parties in the EEA as a competitive constraint is a clear demonstration of this point.

(324) Restrictions preventing a NATO-wide markets (including NATO-ally countries) were also mentioned. These included ITAR; however, as discussed before, this is of limited relevance. Further, Thales reiterated its point that US Type 1 cryptography capable devices can only be sold only with the approval of the US government. This restriction is likely to have bigger significance in a NATO wide market in comparison with an EEA-market as such a market would include also the US.

(325) Overall, the two most appropriate approaches are either an EEA-wide market, including the acknowledgement of constraints by firms based in the bloc of NATO and NATO-ally countries or a wider market corresponding to the bloc of NATO and NATO-ally countries. Due to the restriction resulting from US Type 1 cryptography, the former approach appears more appropriate.

(326) Thus, the Commission considers that the geographic market is EEA-wide with the qualification that firms based outside the EEA but within the bloc of NATO and NATO ally countries can, just like the Parties, also be competitive constraints. This applies to both relevant product markets i.e. to HH-VDLs and to HH A2Gs.

5.4.2. Competitive assessment – horizontal non-coordinated effects

5.4.2.1. Notifying Party's view

(327) The Notifying Party submits that the Transaction does not give rise to any competition concerns in the HH-VDL space. Harris is an insignificant player whose market shares do not exceed [0-5]% over the last three years. L3's market shares fluctuate from one year to another, which illustrates the characteristics of a competitive tender market and evidences that the combined entity will be constrained by global established players such as Thales, Elbit, Rohde-Schwartz and Leonardo. Other than in 2017, Thales and Elbit had a larger share than L3. In any event, Harris and L3 are not close competitors in the EEA. Indeed, the Parties have not competed against each other in any HH-VDL tenders in the EEA in the last three years.

5.4.2.2. Commission's assessment

A) Relevant characteristics of bidding markets

(328) Both the market for HH-VDLs and the market for HH A2Gs are bidding markets. Accordingly, contrary to the Notifying Party's opinion, this fact does not imply that a low number of suppliers is sufficient to guarantee a competitive outcome.

Consequently it is not the case that a merger cannot have negative effects on such markets.[328]

B) Market shares

(329) For the reasons discussed in relation to image intensification NVDs, notably lumpy demand in the context of bidding markets, market shares on the basis of a five year period are also the best indicators of market power. The relevant market shares for both plausible relevant markets are indicated below.

Table 4 – Market shares in HH-VDLs

Company	Market Share (EEA) 2014-2018
Harris	[0-5]%
L3	[20-30]%
Combined	**[20-30]%**
Thales	[10-20]%
Elbit	[10-20]%
Rohde Schwartz	[5-10]%
Leonardo	[5-10]
Others	[20-30]%

Source: Form CO, Table 26

Table 5 - Market shares in HH A2Gs

Company	Market Share (EEA) 2014-2018
Harris	[30-40]%
L3	[0-5]%
Combined	**[40-50]%**
Thales	[5-10]%
Elbit	[5-10]%
Leonardo	[5-10]%
Rohde Scwartz	[0-5]%
Others	[30-40]%

Source: Notifying Party's response to RFI 6, Table 5

(330) In both relevant markets the Transaction gives rise to a horizontally affected market. However, in both cases the Transaction has a small effect. In the case of HH-VDLs the increment is a mere [0-5]% as Harris is a small market player. In this market L3 is the leader and the largest player but it is constrained by several significant competitors such as Thales, Elbit, Rohde Schwartz and Leonardo. The market also comprises a large number of other competitors that together add up to [20-30]% market share.

(331) The reverse applies in the case of the relevant market for HH A2Gs. Harris is the market leader and L3 is small competitor with only [0-5]% market share. This market also comprises a number of small firms with small market shares, such as Rohde Schwartz ([0-5]%) and "others" ([30-40]%), the latter of which includes Mesit ([0-5]%), WB ([0-5]%), Kongsberg ([0-5]%) Bittium ([0-5]%) among others. The more significant competitors are Thales, Elbit and Leonardo, all of which will continue to constrain the merged entity. In summary, the effect of the Transaction is the same as the disappearance of one of the smaller firms.

[328] See Section 5.1.2.2.A(a)

(332) Thus, in both cases the Transaction leads to the disappearance of a small competitor with limited market share and in both cases at least three significant competitors remain. The reason for the radically different market positions of the Parties is that HH-VDLs, which are high data bandwidth devices capable of transmitting full motion video, are more niche products than low data bandwidth radios in the air-to-ground segment. HH A2Gs (which transmit voice, text and, at best, low quality images) are more traditional tactical radios with air-to-ground capabilities and more widely distributed among soldiers.

(333) By way of background, typical users of VDL equipment are Joint Terminal Attack Controller ("JTAC") operators, who direct the action of combat aircraft engaged in close air support and other offensive air operations. These JTAC operators use both an HH-VDL to communicate high quality, real-time transmission of full motion video and a low bandwidth (ground-to-ground) radio to communicate voice messages.[329] This shows that HH-VDLs have very special usage and not as widely distributed among soldiers as air-to-ground low bandwidth radios. Indeed, the total market size of HH-VDLs in reference period (2014-2018) in the EEA was around EUR 98 million whereas the comparable figure for HH A2Gs was around EUR 935 million.[330]

(334) Thus, on the basis of market shares and market structure, the Transaction is unlikely to lead to a serious impediment of effective competition in the markets for HH-VDLs or in the market for HH A2Gs.[331]

C) Competitive strength of the Parties

(335) The feedback from the market investigation on the strength of the Parties and competitors was not very informative and contained a lot of poor quality answers or "*I do not know*" replies. The few pieces of clear information were in line with the assessment based on market shares and market structure.

(336) For example, L.F.E SAS considered that the Rover product line, L3's flagship HH-VDL products, are L3's competitive strength.[332] Safran considered that "*With the ROVER product line, L3 has pioneered the HH VDL domain and established many of its proprietary waveforms as de facto standards"*[333]

(337) By contrast, in the case of Harris, there was no respondent that highlighted a strength specific to HH-VDLs. While L.F.E. SAS highlighted the strength of L3's Rover products, in respect of Harris it replied that it "*does not know*" the strengths

[329] Form CO, paragraph 349

[330] Form CO, Table 26, Notifying Party's response to RFI 6, Table 5

[331] The Commission notes that similar conclusions could be drawn even if there was no distinction made across all hand held devices used by the ground forces, i.e. if all hand held tactical communication devices belonged to one single product market regardless of data bandwidth (high or low data rate transmission) and regardless of sender receiver type (air-to-ground, ground-to-ground, or satellite-to-ground). In that case the market shares would be Harris [20-30]%, L3 [0-5]%. (Notifying Party's response to RFI 6, Table 4). In addition the same conclusion would hold in the even wider hypothetical product market encompassing all tactical mobile systems (i.e. systems carried by troops) used by ground forces. In such a hypothetical market the market shares would be Harris [30-40]% and L3 [0-5]%. (Form CO, Table 23)

[332] Response of L.F.E SAS to Q1 Questionnaire to customers, question 71

[333] Safran's response to Q1 Questionnaire to customers, question 71

of Harris's HH-VDLs.[334] Safran considered that Harris is generally strong in tactical communications, without any reference to HH-VDLs.[335]

(338) Although L3 and Harris were both named most frequently as credible HH-VDL providers,[336] this was not consistent with the explanations. There were a lot of "*I do not know*" explanations and the other explanations indicated that the Parties or Harris were named not exclusively based on their HH-VDL strengths. For example, Safran explained that in general both Parties offer devices with a large choice of waveforms in several frequency bands.[337] Italy's Land Armament Directorate specifically added that it only purchased HH-VDL only from L3 and it estimated Harris's strength on the basis of other products.[338]

(339) Thus the responses, although generally not very informative or poor quality, indicate, in line with the assessment based on market shares, that L3 is strong in HH-VDLs, while Harris is strong in general in tactical communications, including hand held devices (with the exception of HH-VDLs).

D) Closeness of competition

(340) While the rate of poor responses was high, they indicate the lack of closeness. B.M.A.S.R.L indicated that, while both Parties' devices perform well "*Harris is more tactical*",[339] which is a reference to Harris's strength in tactical hand held radios in general (i.e. in HH A2Gs or in all hand held devices) as opposed to strength in HH-VDLs in particular. L.F.E. SAS considered that Harris's and L3's product line are not the same.[340] Thales was of the view that Harris's and L3's HH-VDL products are not even interchangeable "*L3 is focussed on ROVER HH-VDL products while Harris is working on more versatile HH-VDL solutions. They are not interchangeable*."[341] By contrast, Safran and United Technologies Corporation considered that the Parties' products are close substitutes.[342]

(341) Moreover, the Parties have not competed against each other in an HH-VDL tender in the last three years,[343] which shows that competitive interaction between them is minimal. This fact also makes it unlikely that their products are close substitutes.

(342) The Commission therefore considers that the Parties are not close competitors in HH-VDLs.

(343) If the market were more broadly defined and included all HH A2Gs, the Parties would be very distant competitors as in such a market Harris would specialize on

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334 Response of L.F.E SAS to Q1 Questionnaire to customers, question 70

335 Safran's response to Q1 Questionnaire to customers, question 70

336 Q1 Questionnaire to customers, question 72, Q2 Questionnaire to competitors (II), question 29

337 Safran's response to Q1 Questionnaire to customers, question 72

338 Response of Italy's Land Armament Directorate to Q1 Questionnaire to customers, question 72

339 Response of B.M.A.S.R.L to Q1 Questionnaire to customers, question 67

340 Response of L.F.E. S.A.S to Q1 Questionnaire to customers, question 72

341 Thales's response to Q1 Questionnaire to customers, question 72

342 Safran's response to Q1 Questionnaire to customers, question 72, Response of United Technologies Corporation to Q2 Questionnaire to competitors (II), question 26

343 Form CO, paragraph 364

the low data bandwidth devices while L3 on the high data bandwidth devices. If the market were defined even more broadly and included all hand held tactical devices used by ground forces, the Parties would be even more distant competitors with L3 occupying the niche of air-to-ground high bandwidth segment and Harris dominating most other segments.

E) Entry and expansion

(344) The market investigation highlighted certain barriers to entry such as incumbency effects[344] (due to interoperability requirements) and the high level of technology,[345] which implies significant R&D investment and uncertainty. The Commission adds that due to the similarities of the market characteristics, the other barriers mentioned in regard to image intensification NVDs (Section 5.1.2.2.A(f)) also apply. This is because both markets are bidding markets and thus in both cases entrants need to have references and face the costs and complexity of tenders. Also, both markets involve the purchase of complex military equipment and thus in both cases the entrant needs to demonstrate that the products work reliably in battle and has to build out a sales and repair network.

(345) Of these barriers the building out sales and repair network would be easier for a supplier already present in a neighbouring tactical communication equipment market. Further, the order backlog of such a player would help in supporting the fixed costs of entry. However, even these barriers would not disappear (there would still be fixed costs including R&D, tender costs and the repair network needs to be retrained) and the rest of the barriers (uncertainty, references, need to have a credible, battle tested product) would apply. Thus, even for such a player entry is not easy. For example Harris has significant assets, experience in markets neigbouring to HH-VDLs but it has not penetrated HH-VDLs to any significant degree.

(346) Due to the similar market structure, this applies not only to the HH-VDL market but also to the HH A2Gs market.

(347) High entry barriers do not imply in themselves that the Transaction leads to a significant competitive harm. They only indicate that the harm from a Transaction would not be compensated by entry as a countervailing factor. However, in the case of HH-VDLs and HH A2Gs this is not the case as the Transaction does not lead to competitive harm in the first place based on Sections 5.4.2.2.B-D.

F) Buyer power

(348) When rating buyer power, the most frequent rating respondents gave with respect to buyer power was medium.[346]

(349) The market charactristics relevant to buyer power (few suppliers, bidding market, mainly public sector purchasers, military equipment, complex products) are

344 Responses of Thales and United Technologies Corporation to Q2 Questionnaire to competitors (II), question 31

345 Safran's response to Q1 Questionnaire to customers, question 74

346 Q1 Questionnaire to customers, question 74, Q2 Questionnaire to competitors (II), question 34

similar in the case of image intensification NVDs and HH-VDLs and HH A2Gs. Thus the discussion in relation to buyer power in image intensification NVDs generally apply to HH-VDLs and HH A2Gs as well, which implies that buyer power would be insufficient to remedy a competitive harm.[347] One difference is that that specifically for HH-VDLs the purchases are smaller, which gives less bargaining power to buyers. In the case of HH A2Gs this difference would not apply as the purchases involve larger volumes.

(350) However, the lack of countervailing buyer power does not imply in itself that the Transaction leads to a significant competitive harm. It only indicates that the harm from a Transaction would not be compensated by this countervailing factor. However, in the case of HH-VDLs and HH A2Gs this is not the case as the Transaction does not lead to competitive harm in the first place based on Sections 5.4.2.2.B-D.

G) Conclusion

(351) Based on the above considerations, the Commission is of the view that the Transaction does not give rise to serious doubts as to its compatibility with the internal market as regards the markets for HH-VDLs and HH A2Gs. In particular, as explained in detail in Sections 5.4.2.2.B-D the overlap is minimal, the Parties do not compete closely and a suffient number of strong and smaller competitors remain on the market. In addition Harris is not strong in HH-VDLs while L3 is not strong in HH A2Gs.

5.4.3. Competitive assessment – horizontal coordinated effects and non-horizontal effects

5.4.3.1. Horizontal coordinated effects

A) Notifying Party's view

(352) The Notifying Party submits that the Transaction will not give rise to any coordinated effects in HH-VDLs as the EEA market for HH-VDLs both today and post-Transaction does not exhibit the characteristics that facilitate coordination.[348] First, the lack of product homogeneity renders implausible any implicit coordination, especially in a tender market. Second, the market is not transparent as it is to a large extent a bidding market, rendering any implicit collusion inherently unstable. Third, the market is driven by innovation given the technological features of the products. This feature too prevents against the possibility of implicit and sustainable coordination.

B) Commission's assessment

(353) The Commission agrees with the Notifying Party. It is indeed the case that HH-VDLs and HH A2Gs are heterogeneous product group with various functionalities and multiple parameters of competition (i.e. not only price but also quality, weight, performance levels, energy consumption, range, interceptability, reliability, resistance to extreme weather conditions etc), which makes it difficult

[347] See Section 5.1.1.2 A(g)
[348] Form CO, paragraph 379

for competitors to implicitly reach a common understanding on the terms of coordination.

(354) Maintaining the coordination also appears difficult for several reasons. First, the markets for HH-VDLs and HH A2Gs are indeed not transparent, which makes montoring the deviations from the agreed terms of coordination difficult. Second, the lumpy nature of demand incentivizes firms to cheat on the agreed terms. Third, it is indeed the case that markets for HH-VDLs and HH A2Gs are characterised by innovation, which renders any tacit coordination unstable.

(355) Therefore the Commission considers that the Transaction does not raise serious doubts as to its compatibility with the common market on account of horizontal coordinated effects in the markets for HH-VDLs and HH A2Gs.

5.4.3.2. Non-horizontal effects

(356) There are no vertical relationships between the Parties in HH-VDLs, HH A2Gs or indeed in any tactical communication equipment and thus the potential non-horizontal effects can only be conglomerate effects.

A) Notifying Party's view

(357) The Notifying Party considers that given the that the combined entity will have an 2018 EEA market share of well below 30 % in the HH-VDL's segment, the Transaction will not give rise to foreclosure concerns.[349]

B) Commission's assessment

(358) The Commission notes that in this Section it only assesses bundling possibilities within tactical communication equipment used by ground forces. Bundling across the sea, air and land domains is analysed in Section 5.5.

(359) The Commission notes that, as discussed before in Section 5.1.2.2.A(a)), market share in a single year is not suitable to assess market power in bidding markets. Using correct market shares Harris does have some market power in HH A2Gs ([30-40]% as indicated in Section 5.4.2.2). In addition given its general strength in tactical communications used by ground forces,[350] it can have market power in other markets too.

(360) However, a bundling and tying strategy by the merged entity is unlikely to be successful for two reasons.

(361) First, the customer demand is very specific and focused on narrow product segments, which was amply demonstrated by the fact that there was no demand suctsitution across the distinctions discussed in Section 5.4.1.1.D(a). Customers do not purchase broad categories of equipment but specify the detailed parameters of the equipment they buy. For example, they specify that the device should be hand held, suitable for air-to-ground communication, have certain data bandwidth

[349] Form CO, paragraph 381

[350] Q2 Questionnaire to competitors (II), question 36

capacities (ie it should be capable of video transmission), and the corresponding waveforms, frequencies. It is also likely that the tenders contain minimum requirments for range, battery life, durability etc. Thus there appears to be no demand for bundled solutions, which makes a bundling strategy unlikely to succeed. Further, the market investigation contained no indication that this is going to change in the medium term with tactical communications used by ground forces.

(362) Second, there are a number of competitors that are active in multiple markets in the domain of tactical communication equipment used by ground forces and thus these firms can replicate the bundles. For example Thales and Elbit are active in HH-VDLs,[351] HH A2Gs[352] as well as in other hand held devices[353] and in mobile systems carried by military personnel.[354] Leonardo is active in HH-VDLs,[355] HH A2Gs[356] as well as in other hand held devices.[357]. Thus, even if there was demand for such bundles these firms could match the bundles offered by the merged entity, which would defeat a foreclosure attempt.

(363) The Commission also adds that while respondents to the market investigation did raise conglomerate concerns across sea, land and air domains (analysed in Section 5.5), they did not do so with regard to products within the universe of tactical communication devices used by ground forces.

(364) Therefore the Commission considers that the Transaction does not raise serious doubts as to its compatibility with the common market on account of non-horizontal effects.

5.5. Potential conglomerate effects involving broad military communication portfolios

(365) In view of the complementarity of the Parties' product portfolios in the broader secure military communications space, the Transaction could potentially entail conglomerate effects. As discussed in this Section, these potential concerns were put forward by certain respondents to the market investigation.

(366) Namely, it was brought to the Commission's attention that Harris' product offering in tactical communication, and in particular tactical radios used by ground forces, and L3's offering for maritime and airborne platforms and including also HH-VDLs, could be considered to be complementary within the meaning of paragraph 91 of the Non-Horizontal Merger Guidelines.

(367) Based on the information provided by the Notifying Party, the Parties have a common pool of customers, in particular other military technology providers and ultimately the ministries of defence in NATO or NATO allied countries. In particular, military customers with ground, naval and air capabilities could in

351 Section 5.4.2.2.B
352 Section 5.4.2.2.B
353 Notifying Party's response to RFI 6, Table 4
354 Form CO, Table 23
355 Section 5.4.2.2.B
356 Section 5.4.2.2.B
357 Notifying Party's response to RFI 6, Table 4

theory be interested in purchasing a bundle of military communication products that are designed for all three domains (i.e. land, sea and air).

5.5.1. Notifying Party's view

(368) The Notifying Party considers that the Transaction will not lead to conglomerate concerns as the merged entity would have neither the ability nor the incentive to foreclose its rivals by tying or bunding.

(369) The Notifying Party submits that customers are not interested in tied or bundled offerings, and a corresponding strategy would therefore not be profitable.[358]

(370) The Notifying Party explains that given the different technical and mission requirements in the different domains of land, sea, and air, there is no demand for a bundled solution. In any event, it is argued by the Notifying Party, the merged entity would not be "*uniquely positioned to offer such bundles*". Other players could also offer such bundled solutions either alone or through sub-contracting. The Notifying Party refers in this context to Thales, Rockwell Collins, and ViaSat as players that would be capable to offer combinations of ground, air, and maritime communication solutions.[359]

(371) The Notifying Party further submits that tenders do not tend to cover a broad range of products but are rather narrow in scope as well as product-specific. In addition, customers are sophisticated with significant buyer power. Consistent with this approach, the Notifying Party further explains that customers generally seek to ensure that none of the waveforms they specify in tender requirements are patent protected and are therefore accessible to all suppliers.[360]

(372) According to the Notifying Party, while modernisation programmes currently undertaken or planned to be undertaken by military forces may cover a wide range of products, they are typically divided into individual tenders for specific products over a period of years, and customers tend to award the various tenders of such modernisation programmes to several suppliers over a period of time.[361]

5.5.2. Commission's assessment

5.5.2.1. Analytical framework

(373) Conglomerate mergers consist of mergers between companies that are active in closely related markets, for instance suppliers of complementary products or of products which belong to a range of products that is generally purchased by the same set of customers for the same end use.[362]

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[358] Form CO, paragraph 384.
[359] Form CO, paragraph 65.
[360] Form CO, paragraphs 66, 384.
[361] Form CO, paragraph 67.
[362] See Non-Horizontal Merger Guidelines, paragraph 91.

(374) According to the Non-Horizontal Merger Guidelines, in most circumstances, conglomerate mergers do not lead to any competition problems.[363]

(375) However, foreclosure effects may arise when the combination of products in related markets may confer on the merged entity the ability and incentive to leverage a strong market position from one market to another closely related market by means of tying or bundling or other exclusionary practices.[364]

(376) The Non-Horizontal Merger Guidelines distinguish between bundling, which usually refers to the way products are offered and priced by the merged entity and tying, usually referring to situations where customers that purchase one good (the tying good) are required to also purchase another good from the producer (the tied good).[365]

(377) While tying and bundling have often no anticompetitive consequences, in certain circumstances such practices may lead to a reduction in actual or potential competitors' ability or incentive to compete. This may reduce the competitive pressure on the merged entity allowing it to increase prices.[366]

(378) In assessing the likelihood of such a scenario, the Commission examines, first, whether the merged firm would have the ability to foreclose its rivals[367], second, whether it would have the economic incentive to do so[368] and, third, whether a foreclosure strategy would have a significant detrimental effect on competition, thus causing harm to consumers.[369] In practice, these factors are often examined together as they are closely intertwined.

5.5.2.2. Market power

(379) According to the Non-Horizontal Merger Guidelines, the main concern stemming from conglomerate mergers is that the merged entity could leverage its strong market position from one market to the other by means of tying, bundling or other exclusionary practices. In order to be able to foreclose competitors, the new entity must have a significant degree of market power, which does not necessarily amount to dominance, in one of the markets concerned.[370]

(380) Market shares provide useful first indications of the market power and the competitive importance of both the merging parties and their competitors.[371]

(381) Respondents to the market investigation indicated that Harris is a market leader in tactical communications devices used by ground forces such as, for example, hand held ground-to-ground radios, hand held air-to-ground (low data bandwidth)

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363 See Non-Horizontal Merger Guidelines, paragraph 92.
364 See Non-Horizontal Merger Guidelines, paragraph 93.
365 See Non-Horizontal Merger Guidelines, paragraph 97.
366 See Non-Horizontal Merger Guidelines, paragraphs 91 and 93.
367 See Non-Horizontal Merger Guidelines, paragraphs 95 to 104.
368 See Non-Horizontal Merger Guidelines, paragraphs 105 to 110.
369 See Non-Horizontal Merger Guidelines, paragraphs 111 to 118.
370 Non-Horizontal Merger Guidelines, paragraph 99.
371 See Non-Horizontal Merger Guidelines, paragraph 24.

radios, manpack radios, vehicle mounted radios etc.[372] Respondents also considered that L3 is leader in naval communications, ISR data links, including HH-VDLs and string in airborne communications.[373] Respondents considered that the merged entity would have an incentive to bundle these products.[374]

(382) Accordingly, the Commission requested approximate market share data for broad product categories that correspond to the highlighted conglomerate concerns. The various different cuts are presented below

i. On the overall market for tactical communication devices used by ground forces in the EEA Harris has a market share of [40-50] % (and [30-40]% for the ground tactical communications for special forces).[375] This very broad market would include all tactical communication devices used by ground forces without distinguishing between mobile, transportable and fixed systems. L3 is not a significant player in this segment.[376]

ii. In mobile systems carried by troops (ground forces) Harris's market share in the EEA is [30-40]%.[377] This would include all mobile tactical communication systems i.e. both manpack and hand held devices. L3 is not a significant player in this segment.[378]

iii. In hand held devices (tactical equipment used by ground forces without further distinction according to data bandwidth capability or sender-receiver type) Harris has a market share of [30-40]%. [379] L3 is not a significant player in this segment.[380]

(383) As regards L3, its postion is very modest in the EEA in the maritime and airborne communication space. Harris is also not a significant player in these segments.[381] While it is one of the leading players in its US home market with [30-40]% market share in 2018, the company has only [0-5]% EEA market share for maritime and airborne communications taken together.[382]

(384) On the basis of the market shares provided by the Parties, Harris may have some market power in the ground tactical communication space, while L3 is a marginal player in maritime and airborne communications in the EEA. This implies that the merged entity could have market power in the ground tactical communication space in the EEA.

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372 Q2 Questionnaire to competitors (II), question 36
373 Q2 Questionnaire to competitors (II), question 37
374 Q2 Questionnaire to competitors (II), question 37
375 Form CO, Table 4
376 Form CO, Table 3
377 Source: Form CO, Table 23
378 Form CO, Table 3
379 Notifying Party's response to RFI 6, Table 4
380 Form CO, Table 3
381 Form CO, Table 3
382 Form CO, paragraph 58-60, Tables 5-6. The Notifying Party indicates that L3 is not able to provide market share figures for maritime and airborne communications separately.

5.5.2.3. Ability and incentive to foreclose competitors

(385) The Commission considers that the merged entity would have neither the ability nor the incentive to engage in anti-competitive tying or bundling or other exclusionary practices which would result in conglomerate foreclosure effects.

(386) First, the Commission recalls that, as explained in relation to the market definition of relevant to HH-VDLs, in particular in relation to demand side substitution (Section 5.4.1.D)(a)), the demand side in military communication equipments is very specific. Customers do not purchase broad categories of equipment but specify the detailed parameters of the equipment they buy. For example, as explained in Section 5.4.1.D)(a) in the context of HH-VDLs, they specify that the device should be hand held, suitable for air-to-ground communication, have certain databandwidth capacities (ie it should be capable of video transmission), and the corresponding waveforms, frequencies. It is also likely that the tenders contain minimum requirments for range, battery life, durability etc. In other words the Notifying Party is correct in pointing out that submits that tenders do not tend to cover a broad range of products but are rather narrow in scope as well as product-specific. It follows that there appears to be no demand for bundled solutions and thus a bundling strategy would be unfeasible or unprofitable or both.

(387) This conclusion is reinforced by the responses of customers to the questions whether they would purchase bundles. Customers indicated that they are typically not interested in such bundled offerings, with tenders generally not covering a broad range of products but instead being narrow in scope and product specific.[383] None of the customer respondents indicated that they would even consider purchasing such bundles.[384]

(388) Thus, even though competitor respondents, on the one hand, generally considered that the merged entity would have the ability and incentive to bundle Harris' tactical communication products with some of L3's products and indicated that such a bundled proposition would be welcomed by customers,[385] the market practice evident from the discussion on the market definition of HH-VDLs and customer responses suggest otherwise.

(389) Some respondents mentioned a trend, coming from the US, to create multi-domain communication solutions,[386] ie. coordination between ground forces and aviation or helicopters to get multi-domain collaborative combat systems. However, it was also noted that the demand is not there yet and will not necessarily affect the whole of EEA.[387] Further, customers did not confirm such a trend.[388] Thus even the advance of these multi-domain communication solutions appears uncertain at this stage, let alone the possibility that this will change current purchasing patterns, which does not follow automatically from the former. This is because as the Notifying Party noted, even if customers wish to apply a

[383] Questionnaire to customers, question 83.
[384] Questionnaire to customers, question 82.
[385] Questionnaire to competitors, questions 38-40.
[386] Thales's response to Q2 Questionnaire to competitors (II), question 41
[387] Thales's response to Q2 Questionnaire to competitors (II), question 42
[388] Questionnaire to customers, question 82

multi-domain solution, it is still possible that they purchase the necessary equipment over a longer period of time in smaller, specific tenders.

(390) Second, even if there were to be customer demand for such bundles or such demand would emerge in the foreseeable future, there would be viable alternative suppliers on the market which could offer similar bundled solutions, either alone or in consortia with others, and thus meet such demand from customers. For example Thales considered that Leonardo and Rohde Shwartz and itself are all active in all three domains (i.e. land, sea and air) and would be capable of replicating the merged entity's bundle that would include Harris's tactical communication products and some of L3's products from the sea and airborne domain.[389] United Technologies Corporation, indicated similarly that such competing bundles could be offered "*via partnership*" by others.[390] On the customer side, a number of respondents indicate the existence of competing suppliers that could offer such bundles, were there to be demand for such offers,[391] without, however, naming them.

(391) Thus the Commission considers that even if the merged entity could sell such bundles, other competitors could match the offer, implying that the foreclosure strategy is unlikely to be successful.

(392) Third, customer reactions should also not be discounted. It may very well be that faced with a bundling strategies customers devise counterstrategies such as devising an interoperable system and specifying in tenders the interoperability requirements.

(393) The market investigation as a whole, therefore, provides insufficient evidence that the merged entity would have the ability to foreclose competing suppliers through anti-competitive bundling or tying practices, notably through the bundling of naval, air and ground communications solutions. The reasons include the lack of demand for such bundles, the existence of competitors that can match the bundled offers and possibly customer counter-strategies.

5.5.2.4. Conclusion

(394) Based on the above considerations, the Commission is of the view that the Transaction does not give rise to serious doubts as to its compatibility with the internal market in relation to anti-competitive conglomerate effects involving broad military communications portfolios.

6. COMMITMENTS

(395) In order to remove the serious doubts arising from the Transaction in relation to the markets for image intensification NVDs and I2Ts, as well as non-horizontal concerns related to NVDs and I2Ts on 28 May 2019 the Notifying Party submitted commitments pursuant to Article 6(2) of the Merger Regulation (the

[389] Thales's response to Q2 Questionnaire to competitors (II), question 41

[390] Thales' and United Technologies' responses to queationnaire to competitors, question 41.1.

[391] Questionnaire to customers, question 85.

"Commitments"). The Commitments are annexed to this decision and form an integral part thereof.

6.1. Description of the Commitments

(396) The Commitments consist of the divestment of Harris' entire night vision business (hereinafter also referred to as the "Divestment Business"). The Divestment Business includes all of Harris's NVDs (i.e., Harris's image intensification NVDs and Harris's fusion NVDs), all of Harris's I2Ts, and all associated spare parts and service sales.

(397) The Divestment Business is based out of a single production facility located in Roanoke, Virginia (USA) and includes all assets and staff that contribute to the current operation or are necessary to ensure the viability and competitiveness of the Divestment Business, in particular:

i. all tangible and intangible assets (including intellectual property rights) necessary for the operation of the Divestment Business in substantially the same manner as immediately prior to the Closing;

ii. all licences, permits and authorisations issued by any governmental organisation for the benefit of the Divestment Business;

iii. all contracts, leases, commitments and customer orders of the Divestment Business, as well as all customer, sales, supplier, accounting, financial and other business records primarily used in the Divestment Business (other than certain excluded business records); and

iv. Personnel

(398) Finally, the Commitments contain related commitments, including those regarding the separation of the Divestment Business from the retained businesses, the preservation of the viability, marketability and competitiveness of the Divestment Business, including the appointment of a monitoring trustee and, if necessary, a divestiture trustee.

6.2. Commission's assessment of the Commitments

6.2.1. Framework for the Commission's assessment of the commitments

(399) According to the Commission's notice on remedies acceptable under Council Regulation (EC) No 139/2004 and under Commission Regulation (EC) No 802/2004 (the "Remedies Notice"), where a concentration raises serious doubts as to its compatibility with the internal market, the parties may undertake to modify the concentration so as to resolve the competition concerns identified by the Commission and thereby gain clearance of their merger.

(400) It is for the parties to the concentration to put forward commitments.[392] The Commission only has the power to accept commitments that are deemed

[392] Remedies Notice, paragraph 6.

capable of rendering the concentration compatible with the internal market.[393] In Phase I, commitments can only be accepted where the competition problem is readily identifiable and can easily be remedied. The competition problem therefore needs to be so straightforward and the remedies so clear-cut that it is not necessary to enter into an in-depth investigation. The commitments must be sufficient to clearly rule out serious doubts within the meaning of Article 6(1)(c) of the Merger Regulation. Where the assessment indicates that the proposed commitments remove the grounds for serious doubts on this basis, the Commission clears the merger in phase I.[394]

(401) In assessing whether or not commitments will restore effective competition, the Commission considers their type, scale and scope by reference to the structure and characteristics of the market in which the Commission has identified serious doubts as to the compatibility of the notified concentration with the internal market.[395]

(402) Divestiture commitments are the best way to eliminate serious doubts resulting from horizontal overlaps of the merging parties' activities.[396] The divested business must consist of a viable business that if operated by a suitable purchaser, can compete effectively with the merged entity on a lasting basis and that is divested as a going concern.[397]

(403) The business to be divested must include all the assets which contribute to its current operation or which are necessary to ensure its viability and competitiveness and all personnel which are currently employed or which are necessary to ensure the business' viability and competitiveness. Personnel and assets which are currently shared between the business to be divested and other businesses of the parties, but which contribute to the operation of the business or which are necessary to ensure its viability and competitiveness, must also be included. Otherwise, the viability and competitiveness of the business to be divested would be endangered.

(404) Furthermore, the intended effect of the divestiture will only be achieved if and once the business is transferred to a suitable purchaser with proven relevant expertise and ability to maintain and develop the business to be divested as a viable and active competitive undertaking. This may imply that some specific purchaser requirements are included in the commitments to ensure that the transferred business remains viable. The potential of a business to attract a suitable purchaser is an important element of the Commission's assessment of the appropriateness of the proposed commitment.[398]

[393] Remedies Notice, paragraph 9.
[394] Remedies Notice, paragraph 81.
[395] Remedies Notice, paragraph 12.
[396] Remedies Notice, paragraph17.
[397] Remedies Notice, paragraph 23.
[398] Remedies Notice, paragraph 47.

6.2.2. Assessment of the Commitments

(405) The competition concerns in this case are readily identifiable in respect of the relevant markets for image intensification NVDs and I2Ts,[399] as well as non-horizontal concerns relationg to NVDs and I2Ts, given the Parties' high market shares, the closeness of their offering, the characteristics of the markets at stake, the limited number of competitors, lack of countervailing buyer power and the high barriers to entry identified.

(406) The Commission's assessment of the Commitments focuses on (i) whether the Commitments are suitable and sufficient to remove the competition concerns caused by the Transaction; (ii) whether the Divestment Business constitutes a viable business able to compete effectively with the merged entity on a lasting basis; (iii) whether there are specific conditions that a potential purchaser should fulfil, (iv) whether the Divestment Business is sufficiently attractive to find a suitable purchaser. On 4 April 2019 Harris signed an asset purchase agreement with Elbit pursuant to which Elbit will acquire the Divestment Business. However, the Commitments are not submitted as a fix-it-first solution and therefore the Commission will carry out a separate assessment of Elbit's suitability as a purchaser following the closing of the acquisition of L3 by Harris. In any event, and without prejudice to this separate assessment that the Commission will carry out at the time of the purchaser approval, the Commission's assessment of the Commitments include a preliminary overview of Elbit's suitability as a purchaser of the Divestment Business.

Suitability and viability of the Divestment Business

(407) In order to carry out this assessment, the Commission launched a market test of the Commitments on 29 May 2019. The results of the market test, which was addressed to competitors and customers, are generally positive and confirmed that the Commitments are suitable to eliminate the competition concerns identified by the Commission.

(408) First, the Divestment Business consists of the divestment of Harris' global night vision business which eliminates the entire overlap between the Parties in night vision devices more broadly and in the markets for image intensification NVDs and I2Ts where the Commission's investigation has revealed that the Transaction would raise competition concerns.

(409) Second, the Divestment Business is a standalone business, which was previously acquired as such by Harris from Exelis in 2015 as a self-standing business division. Prior to Exelis' ownership, the Divestment Business had been operated by ITT Inc. for several decades.[400] It therefore appears to be a complete, standalone business with all the necessary assets and resources to be a viable force on the market, including engineering, operational, manufacturing, sales, HR, finance, contracts, and management personnel. This was confirmed by the market test, where all the respondents which expressed a view on the suitability of the Commitments, considered that, subject to it being divested to a suitable

[399] Including also the other alternative relevant product markets discussed in Section 5.1.2.2.B), e.g. image intensification NVDs further segmented by device type.

[400] Form RM, paragraphs 2 and 9.

purchaser, the Divestment Business includes all the necessary assets to operate and effectively compete on the markets for image intensification NVDs and I2Ts.[401] One respondent to the remedies market test highlighted in this sense the fact that "*this business has sold twice in recent times, and demonstrated an ability to not only continue, but lead the industry*.[402]

(410) The Divestment Business includes the transfer of key personnel currently working at the Divestment Business and of all personnel currently working at or assigned to the Divestment Business who accept an offer of employment with the purchaser. In this regard, a significant number of respondents to the remedies market test identified the role of Senior International Business Development Manager as an important part of Harris's current night vision business. This person is responsible for developing strategy and capturing international business opportunities at Harris's night vision business.The person currently holding this position has not been identified as key personnel by Harris but is nevertheless part of the Divestment Business and will be transferred subject to acceptance of an offer of employment with the purchaser. In any event, the Senior International Business Development Manager reports to the Director of Sales, which is in turn included as key personnel in the Divestment Business.

Purchaser criteria

(411) As regards the criteria to identify a suitable purchaser for the Divestment Business, the majority of respondents to the market test consider that previous knowledge, experience and reputation in the defence industry are required in order to run the Divestment Business viably and competitively.[403] The Commission considers that the purchaser criteria foreseen in the Commitments are sufficient.

Attractiveness of the Divestment Business

(412) The Divestment Business appears to be an attractive and profitable business with expected revenue growth. The divestment business had a total turnover of EUR […] in 2018, which is expected to grow significantly in the next two years. The earnings before interest, tax, depreciation and amortisation ("EBITDA") were […] in that period. The projected revenue and EBITDA increases are due in part to a number of growth initiatives undertaken by Harris.[404] The first such growth initiative involves [description of growth initiative]. The second initiative is [description of growth initiative]. This intiative implies [description of growth initiative].[405]

(413) The Parties claim that the Divestment Business has generated large interest, as a result of which Harris has already been able to swiftly reach an agreement with Elbit on April 4, 2019.[406] In their view, in the hypothetical scenario where Elbit would not acquire the Divestment Business, the remaining bidders would

[401] Responses to question 3 of the Commission's electronic market test of the commitments.
[402] Transaero's response to question 5 of the Commission's electronic market test of the commitments.
[403] Responses to question 6 of the Commission's electronic market test of the commitments.
[404] Form RM, paragraph 32.
[405] Form RM, confidential Annex 20
[406] Form RM, paragraph 36.

continue to be interested in acquiring it, and thus the Divestment Business would nevertheless within a short time-frame be acquired by a suitable purchaser.[407]

(414) While a number of respondents to the market test indicated that, due to their smaller size or different business focus, they would not be interested to acquire the Divestment Business, the majority of respondents that expressed a view do consider it an attractive business. Respondents pointed to the fact that the Divestment Business includes leading edge technology and that the market trends and the positioning of Harris in the NVDs and I2Ts business make the Divestment Business attractive.[408] Moreover, the Commission has been able to confirm that sufficient interest in acquiring the Divestment Business still remains in the market. In the context of the market testing of the Commitments, the Commission contacted the other interested bidders in order to verify whether such appetite for the acquisition of the Divestment Business remained. In addition to Elbit's interest, [description of the action process].[409] A financial investor with expertise in the defence sector also indicated that the Divestment Business is an attractive package and confirmed an interest to purchase it.[410]

Preliminary assessment of Elbit's suitability as purchaser of the Divestment Business

(415) Given that Harris has signed an asset purchase agreement with Elbit pursuant to which Elbit will acquire the Divestment Business, the Commission's market test of the remedies included a number of questions about Elbit's suitability as a purchaser of the Divestment Business.

(416) Elbit is an Israel-based global technology and defence company which supplies NVDs, among other products for the defence industry. Elbit's EEA sales consist of thermal NVDs (which the Divestment Business does not produce), and image intensification NVDs (which the Divestment Business does produce). Elbit does not produce I2Ts or fusion NVDs (which the Divestment Business produces).[411]

(417) The market test revealed that market participants perceive Elbit as a solid player already active in the defence business, with previous experience in NVDs and other related products. The majority of respondents that expressed a view perceive Elbit as a suitable purchaser, with the required financial resources and capabilities to maintain and develop the Divestment business as a viable competitive force on the market.[412]

(418) Thus, given its financial resources, experience in NVDs and defence business, Elbit appears to be suitable from the point of view of maintaining and developing the business as a viable competitive force.

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[407] Form RM, paragraph 38.

[408] Responses to question 5 of the Commission's electronic market test of the commitments.

[409] Email of 12 June 2019 in response to question 14 of the Commission's electronic market test of the commitments.

[410] Email of 13 June 2019 in response to question 14 of the Commission's electronic market test of the commitments.

[411] Harris' response to RFI 5.

[412] Response to question 13 of the Commission's electronic market test of the commitments.

(419) This preliminary assessment is without prejudice to the Commission's final assessment of the suitability of Elbit as the purchaser of the Divestment Business which shall be conducted separately at a later stage.

6.2.3. Conclusion

(420) For the reasons outlined above, the Commission considers that the Commitments entered into by the Notifying Party are sufficient to eliminate the serious doubts as to the compatibility of the Transaction with the internal market.

(421) The remedies in section B of the Annex constitute conditions attached to this decision, as only through full compliance therewith can the structural changes in the relevant markets be achieved. The other remedies set out in the Annex constitute obligations, as they concern the implementing steps which are necessary to achieve the modifications sought in a manner compatible with the internal market.

7. CONCLUSION

(422) For the above reasons, the Commission has decided not to oppose the notified operation as modified by the commitments annexed to this decision and to declare it compatible with the internal market and with the functioning of the EEA Agreement, subject to full compliance with the conditions in section B of the commitments annexed to the present decision and with the obligations contained in the other sections of the said commitments. This decision is adopted in application of Article 6(1)(b) in conjunction with Article 6(2) of the Merger Regulation and Article 57 of the EEA Agreement.

For the Commission

(Signed)
Margrethe VESTAGER
Member of the Commission

CASE COMP / M.9234

PROPOSED ACQUISITION OF SOLE CONTROL BY HARRIS CORPORATION OF L3 TECHNOLOGIES, INC.

REVISED NON-CONFIDENTIAL COMMITMENTS

NOTIFICATION OF A CONCENTRATION PURSUANT TO COUNCIL REGULATION (EC) 139/2004

May 28, 2019



MAY 28, 2019

Case M.9234 – Harris Corporation / L3 Technologies, Inc.

REVISED COMMITMENTS TO THE EUROPEAN COMMISSION

Pursuant to Article 6(2) of Council Regulation (EC) No 139/2004 (the "***Merger Regulation***"), Harris Corporation (the "***Notifying Party***") hereby enters into the following Commitments (the "***Commitments***") vis-à-vis the European Commission (the "***Commission***") with a view to rendering its acquisition of L3 Technologies, Inc. (the "***Concentration***") compatible with the internal market and the functioning of the EEA Agreement.

This text shall be interpreted in light of the Commission's decision pursuant to Article 6(1)(b) of the Merger Regulation to declare the Concentration compatible with the internal market and the functioning of the EEA Agreement (the "***Decision***"), in the general framework of European Union law, in particular in light of the Merger Regulation, and by reference to the Commission Notice on remedies acceptable under Council Regulation (EC) No 139/2004 and under Commission Regulation (EC) No 802/2004 (the "***Remedies Notice***").

Section A. Definitions

1. For the purpose of the Commitments, the following terms shall have the following meaning:

   Affiliated Undertakings: undertakings controlled by the Parties and/or by the ultimate parents of the Parties, whereby the notion of control shall be interpreted pursuant to Article 3 of the Merger Regulation and in light of the Commission Consolidated Jurisdictional Notice under Council Regulation (EC) No 139/2004 on the control of concentrations between undertakings (the "***Consolidated Jurisdictional Notice***").

   Assets: the assets that contribute to the current operation or are necessary to ensure the viability and competitiveness of the Divestment Business as indicated in Section B, paragraph 6 (a), (b), (c) and (d) and described in the Schedule.

   Closing: the transfer of the legal title to the Divestment Business to the Purchaser.

   Closing Period: the period of 3 months from the approval of the Purchaser and the terms of sale by the Commission.

   Confidential Information: any business secrets, know-how, commercial information, or any other information of a proprietary nature that is not in the public domain.

   Concentration: the Notifying Party's acquisition of sole control over L3 Technologies, Inc.

   Conflict of Interest: any conflict of interest that impairs the Trustee's objectivity and independence in discharging its duties under the Commitments.

   Divestment Business: the Notifying Party's night vision business as defined in Section B and in the Schedule which the Notifying Party commits to divest.

   Divestiture Trustee: one or more natural or legal person(s) who is/are approved by the Commission and appointed by the Notifying Party and who has/have received from the Notifying Party the exclusive Trustee Mandate to sell the Divestment Business to a Purchaser at no

minimum price.

Effective Date: the date of adoption of the Decision.

First Divestiture Period: the period of [CONFIDENTIAL] from the Effective Date.

Hold Separate Manager: the person appointed by the Notifying Party for the Divestment Business to manage the day-to-day business under the supervision of the Monitoring Trustee.

Key Personnel: all personnel necessary to maintain the viability and competitiveness of the Divestment Business, as listed in the Schedule, including the Hold Separate Manager.

Monitoring Trustee (or Trustee): one or more natural or legal person(s) who is/are approved by the Commission and appointed by the Notifying Party, and who has/have the duty to monitor the Notifying Party's compliance with the conditions and obligations attached to the Decision.

Notifying Party: Harris Corporation.

Parties: the Notifying Party and L3 Technologies, Inc.

Personnel: all staff currently employed by or assigned to the Divestment Business.

Purchaser: the entity approved by the Commission as acquirer of the Divestment Business in accordance with the criteria set out in Section D.

Purchaser Criteria: the criteria laid down in paragraph 16 of these Commitments that the Purchaser must fulfil in order to be approved by the Commission.

Schedule: the schedule to these Commitments describing more in detail the Divestment Business.

Trustee(s): the Monitoring Trustee and/or the Divestiture Trustee as the case may be.

Trustee Divestiture Period: the period of [CONFIDENTIAL] from the end of the First Divestiture Period.

Section B. The commitment to divest and the Divestment Business

Commitment to divest

2. In order to maintain effective competition, the Notifying Party commits to divest, or procure the divestiture of the Divestment Business by the end of the Trustee Divestiture Period as a going concern to a purchaser and on terms of sale approved by the Commission in accordance with the procedure described in paragraph 17 of these Commitments. To carry out the divestiture, the Notifying Party commits to find a purchaser and to enter into a final binding sale and purchase agreement for the sale of the Divestment Business within the First Divestiture Period.[1] If the Notifying Party has not entered into such an agreement at the end of the First Divestiture Period, the Notifying Party shall grant the Divestiture Trustee an exclusive mandate to sell the Divestment

[1] As the Commission is aware, following an auction process, on April 4, 2019, the Notifying Party entered into a sale and purchase agreement with Elbit Systems of America, LLC ("**Elbit**") for the sale of the Divestment Business. For the avoidance of doubt, the following sections on Due diligence and Reporting, and similar provisions, apply in the event the Commission rejects Elbit as the Purchaser.

Business in accordance with the procedure described in paragraph 29 in the Trustee Divestiture Period.

3. The Notifying Party shall be deemed to have complied with this commitment if:

   (a) by the end of the Trustee Divestiture Period, the Notifying Party or the Divestiture Trustee has entered into a final binding sale and purchase agreement and the Commission approves the proposed purchaser and the terms of sale as being consistent with the Commitments in accordance with the procedure described in paragraph 17; and

   (b) the Closing of the sale of the Divestment Business to the Purchaser takes place within the Closing Period.

4. In order to maintain the structural effect of the Commitments, the Notifying Party shall, for a period of 10 years after Closing, not acquire, whether directly or indirectly, the possibility of exercising influence (as defined in paragraph 43 of the Remedies Notice, footnote 3) over the whole or part of the Divestment Business, unless, following the submission of a reasoned request from the Notifying Party showing good cause and accompanied by a report from the Monitoring Trustee (as provided in paragraph 43 of these Commitments), the Commission finds that the structure of the market has changed to such an extent that the absence of influence over the Divestment Business is no longer necessary to render the proposed concentration compatible with the internal market.

Structure and definition of the Divestment Business

5. The Divestment Business encompasses the Notifying Party's night vision business,[2] which is based out of a single production facility with a registered place of business and management at 7635 Plantation Road, Roanoke, Virginia 24019, USA. The Notifying Party designs and manufactures all of its night vision products in this facility. The Divestment Business includes the rights and benefits in and to all customer and supplier contracts entered into by the Notifying Party and primarily related to the Divestment Business, as well as all operating permits, licenses, and authorizations, to the extent transferable under applicable law held by the Notifying Party that are primarily used in the Divestment Business or for the production facility or the ownership or current operation thereof.

6. The legal and functional structure of the Divestment Business as operated to date is described in the Schedule. To the extent transferable under applicable law, the Divestment Business includes all assets and staff that contribute to the current operation or are necessary to ensure the viability and competitiveness of the Divestment Business, in particular:

   (a) all tangible and intangible assets (including intellectual property rights) necessary for the operation of the Divestment Business in substantially the same manner as immediately prior to the Closing;

   (b) all licences, permits and authorisations issued by any governmental organisation for the benefit of the Divestment Business;

[2] Night vision equipment and components include, in particular, image intensification night vision devices, fusion night vision devices, and image intensifier tubes.

(c) all contracts, leases, commitments and customer orders of the Divestment Business, as well as all customer, sales, supplier, accounting, financial and other business records primarily used in the Divestment Business (other than certain excluded business records); and

(d) the Personnel.

7. In addition, the Divestment Business includes the benefit, for a transitional period of 6 to 12 months (depending on the service concerned) after Closing and on terms and conditions equivalent to those at present afforded to the Divestment Business, of arrangements under which the Notifying Party or its Affiliated Undertakings supply certain support services to the Divestment Business,[3] as detailed in the Schedule, unless otherwise agreed with the Purchaser. Strict firewall procedures will be adopted so as to ensure that any competitively sensitive information related to, or arising from such supply arrangements (for example, product roadmaps) will not be shared with, or passed on to, anyone outside the business units concerned.

Section C. Related commitments

Preservation of viability, marketability and competitiveness

8. From the Effective Date until Closing, the Notifying Party shall preserve or procure the preservation of the economic viability, marketability and competitiveness of the Divestment Business, in accordance with good business practice, and shall minimise as far as possible any risk of loss of competitive potential of the Divestment Business. In particular the Notifying Party undertakes:

(a) not to carry out any action that might have a significant adverse impact on the value, management or competitiveness of the Divestment Business or that might alter the nature and scope of activity, or the industrial or commercial strategy or the investment policy of the Divestment Business;

(b) to make available, or procure to make available, sufficient resources for the development of the Divestment Business, on the basis and continuation of the existing business plans;

(c) to take all reasonable steps, or procure that all reasonable steps are being taken, including appropriate incentive schemes (based on industry practice), to encourage all Key Personnel to remain with the Divestment Business, and not to solicit or move any Personnel to the Notifying Party's remaining business. Where, nevertheless, individual members of the Key Personnel exceptionally leave the Divestment Business, the Notifying Party shall provide a reasoned proposal to replace the person or persons concerned to the Commission and the Monitoring Trustee. The Notifying Party must be able to demonstrate to the Commission that the replacement is well suited to carry out the functions exercised by those individual members of the Key Personnel. The replacement shall take place under the supervision of the Monitoring

[3] [CONFIDENTIAL]

Trustee, who shall report to the Commission.

Hold-separate obligations

9. The Notifying Party commits, from the Effective Date until Closing, to keep the Divestment Business separate from the business it is retaining and to ensure that unless explicitly permitted under these Commitments: (i) management and staff of the businesses retained by the Notifying Party have no involvement in the Divestment Business; (ii) the Key Personnel and Personnel of the Divestment Business have no involvement in any business retained by the Notifying Party and do not report to any individual outside the Divestment Business.

10. Until Closing, the Notifying Party shall assist the Monitoring Trustee in ensuring that the Divestment Business is managed as a distinct and saleable entity separate from the businesses which the Notifying Party is retaining. Immediately after the adoption of the Decision, the Notifying Party shall appoint a Hold Separate Manager. The Hold Separate Manager shall be part of the Key Personnel, shall manage the Divestment Business independently and in the best interest of the business with a view to ensuring its continued economic viability, marketability and competitiveness and its independence from the businesses retained by the Notifying Party. The Hold Separate Manager shall closely cooperate with and report to the Monitoring Trustee and, if applicable, the Divestiture Trustee. Any replacement of the Hold Separate Manager shall be subject to the procedure laid down in paragraph 8(c) of these Commitments. The Commission may, after having heard the Notifying Party, require the Notifying Party to replace the Hold Separate Manager.

Ring-fencing

11. The Notifying Party shall implement, or procure to implement, all necessary measures to ensure that it does not, after the Effective Date, obtain any Confidential Information relating to the Divestment Business and that any such Confidential Information obtained by the Notifying Party before the Effective Date will be eliminated and not be used by the Notifying Party. This includes measures vis-à-vis the Notifying Party's appointees on the supervisory board and/or board of directors of the Divestment Business, if any. In particular, the participation of the Divestment Business in any central information technology network shall be severed to the extent possible, without compromising the viability of the Divestment Business. The Notifying Party may obtain or keep information relating to the Divestment Business which is reasonably necessary for the divestiture of the Divestment Business or the disclosure of which to the Notifying Party is required by law.

Non-solicitation and no-hire clause

12. The Notifying Party undertakes, subject to customary limitations, not to solicit, and to procure that its Affiliated Undertakings do not induce, encourage or solicit for employment or hire, the Personnel transferred with the Divestment Business for a period of [CONFIDENTIAL] after Closing.

Due diligence[4]

13. In order to enable potential purchasers to carry out a reasonable due diligence of the Divestment Business, the Notifying Party shall, subject to customary confidentiality assurances and dependent on the stage of the divestiture process:

    (a) provide to potential purchasers sufficient information as regards the Divestment Business;

    (b) provide to potential purchasers sufficient information relating to the Personnel and allow them reasonable access to the Personnel.

Reporting[5]

14. The Notifying Party shall submit written reports in English on potential purchasers of the Divestment Business and developments in the negotiations with such potential purchasers to the Commission and the Monitoring Trustee no later than 10 days after the end of every month following the Effective Date (or otherwise at the Commission's request). The Notifying Party shall submit a list of all potential purchasers having expressed interest in acquiring the Divestment Business to the Commission at each and every stage of the divestiture process, as well as a copy of all the offers made by potential purchasers within five days of their receipt.

15. The Notifying Party shall inform the Commission and the Monitoring Trustee on the preparation of the data room documentation and the due diligence procedure and shall submit a copy of any information memorandum to the Commission and the Monitoring Trustee before sending the memorandum out to potential purchasers.

Section D. The Purchaser[6]

16. In order to be approved by the Commission, the Purchaser must fulfil the following criteria:

    (a) the Purchaser shall be independent of and unconnected to the Notifying Party and its Affiliated Undertakings (this being assessed having regard to the situation following the divestiture).

    (b) the Purchaser shall have the financial resources, proven expertise and incentive to maintain and develop the Divestment Business as a viable and active competitive force in competition with the Parties and other competitors;

    (c) the acquisition of the Divestment Business by the Purchaser must neither be likely to create, in light of the information available to the Commission, *prima facie* competition concerns nor give rise to a risk that the implementation of the Commitments will be delayed. In particular, the Purchaser must reasonably be

4 *See* footnote 1.

5 *See* footnote 1.

expected to obtain all necessary approvals from the relevant regulatory authorities for the acquisition of the Divestment Business.

17. The final binding sale and purchase agreement (as well as ancillary agreements) relating to the divestment of the Divestment Business shall be conditional on the Commission's approval. When the Notifying Party has reached an agreement with a purchaser, it shall submit a fully documented and reasoned proposal, including a copy of the final agreement(s), within one week to the Commission and the Monitoring Trustee. The Notifying Party must be able to demonstrate to the Commission that the purchaser fulfils the Purchaser Criteria and that the Divestment Business is being sold in a manner consistent with the Commission's Decision and the Commitments. For the approval, the Commission shall verify that the purchaser fulfils the Purchaser Criteria and that the Divestment Business is being sold in a manner consistent with the Commitments including their objective to bring about a lasting structural change in the market. The Commission may approve the sale of the Divestment Business without one or more Assets or parts of the Personnel, or by substituting one or more Assets or parts of the Personnel with one or more different assets or different personnel, if this does not affect the viability and competitiveness of the Divestment Business after the sale, taking account of the proposed purchaser.

Section E. Trustee

I. Appointment procedure

18. The Notifying Party shall appoint a Monitoring Trustee to carry out the functions specified in these Commitments for a Monitoring Trustee. The Notifying Party commits not to close the Concentration before the appointment of a Monitoring Trustee.

19. If The Notifying Party has not entered into a binding sale and purchase agreement regarding the Divestment Business one month before the end of the First Divestiture Period or if the Commission has rejected a purchaser proposed by The Notifying Party at that time or thereafter, The Notifying Party shall appoint a Divestiture Trustee. The appointment of the Divestiture Trustee shall take effect upon the commencement of the Trustee Divestiture Period.

20. The Trustee shall:

(i) at the time of appointment, be independent of the Notifying Party and its Affiliated Undertakings;

(ii) possess the necessary qualifications to carry out its mandate, for example have sufficient relevant experience as an investment banker or consultant or auditor; and

(iii) neither have nor become exposed to a Conflict of Interest.

21. The Trustee shall be remunerated by the Notifying Party in a way that does not impede the independent and effective fulfilment of its mandate. In particular, where the remuneration package of a Divestiture Trustee includes a success premium linked to the final sale value of the Divestment Business, such success premium may only be earned if the divestiture takes place within the Trustee Divestiture Period.

Proposal by the Notifying Party

22. The Notifying Party shall submit to the Commission the name or names of one or more natural or legal persons whom the Notifying Party proposes to appoint as the Monitoring Trustee to the Commission for approval. The Notifying Party shall submit the proposal sufficiently in advance to enable the Commission to approve the proposed Monitoring Trustee in conjunction with the Decision on the Effective Date.. The proposal shall contain sufficient information for the Commission to verify that the person or persons proposed as Trustee fulfil the requirements set out in paragraph 20 and shall include:

    (a) the full terms of the proposed mandate, which shall include all provisions necessary to enable the Trustee to fulfil its duties under these Commitments; and

    (b) the outline of a work plan which describes how the Trustee intends to carry out its assigned tasks.

    (c) an indication whether the proposed Trustee is to act as both Monitoring Trustee and Divestiture Trustee or whether different trustees are proposed for the two functions.

Approval or rejection by the Commission

23. The Commission shall have the discretion to approve or reject the proposed Trustee(s) and to approve the proposed mandate subject to any modifications it deems necessary for the Trustee to fulfil its obligations. If only one name is approved, the Notifying Party shall appoint or cause to be appointed the person or persons concerned as Trustee, in accordance with the mandate approved by the Commission. If more than one name is approved, the Notifying Party shall be free to choose the Trustee to be appointed from among the names approved. The Trustee shall be appointed within one week of the Commission's approval, in accordance with the mandate approved by the Commission.

New proposal by the Notifying Party

24. If all the proposed Trustees are rejected, the Notifying Party shall submit the names of at least two more natural or legal persons within one week of being informed of the rejection, in accordance with paragraphs 18 and 23 of these Commitments.

Trustee nominated by the Commission

25. If all further proposed Trustees are rejected by the Commission, the Commission shall nominate a Trustee, whom the Notifying Party shall appoint, or cause to be appointed, in accordance with a trustee mandate approved by the Commission.

II. <u>Functions of the Trustee</u>

26. The Trustee shall assume its specified duties and obligations in order to ensure compliance with the Commitments. The Commission may, on its own initiative or at the request of the Trustee or the Notifying Party, give any orders or instructions to the Trustee in order to ensure compliance

with the conditions and obligations attached to the Decision.

Duties and obligations of the Monitoring Trustee

27. The Monitoring Trustee shall:

(i) propose in its first report to the Commission a detailed work plan describing how it intends to monitor compliance with the obligations and conditions attached to the Decision.

(ii) oversee, in close co-operation with the Hold Separate Manager, the on-going management of the Divestment Business with a view to ensuring its continued economic viability, marketability and competitiveness and monitor compliance by the Notifying Party with the conditions and obligations attached to the Decision. To that end the Monitoring Trustee shall:

(a) monitor the preservation of the economic viability, marketability and competitiveness of the Divestment Business, and the keeping separate of the Divestment Business from the business retained by the Parties, in accordance with paragraphs 8 and 9 of these Commitments;

(b) supervise the management of the Divestment Business as a distinct and saleable entity, in accordance with paragraph 10 of these Commitments;

(c) with respect to Confidential Information:

- determine all necessary measures to ensure that the Notifying Party does not after the Effective Date obtain any Confidential Information relating to the Divestment Business,

- in particular strive for the severing of the Divestment Business' participation in a central information technology network to the extent possible, without compromising the viability of the Divestment Business,

- make sure that any Confidential Information relating to the Divestment Business obtained by the Notifying Party before the Effective Date is eliminated and will not be used by the Notifying Party, and

- decide whether such information may be disclosed to or kept by the Notifying Party as the disclosure is reasonably necessary to allow the Notifying Party to carry out the divestiture or as the disclosure is required by law;

(d) monitor the splitting of assets and the allocation of Personnel between the Divestment Business and the Notifying Party or Affiliated Undertakings;

(iii) propose to the Notifying Party such measures as the Monitoring Trustee considers necessary to ensure the Notifying Party's compliance with the conditions and obligations attached to the Decision, in particular the maintenance of the full economic viability, marketability or competitiveness of the Divestment Business, the holding separate of the Divestment Business and the non-disclosure of competitively sensitive information;

(iv) review and assess potential purchasers[7] as well as the progress of the divestiture process and verify that, dependent on the stage of the divestiture process:

(a) potential purchasers receive sufficient and correct information relating to the Divestment Business and the Personnel in particular by reviewing, if available, the data room documentation, the information memorandum and the due diligence process, and

(b) potential purchasers are granted reasonable access to the Personnel;

(v) act as a contact point for any requests by third parties, in particular potential purchasers, in relation to the Commitments;

(vi) provide to the Commission, sending the Notifying Party a non-confidential copy at the same time, a written report within 15 days after the end of every month that shall cover the operation and management of the Divestment Business as well as the splitting of assets and the allocation of Personnel so that the Commission can assess whether the business is held in a manner consistent with the Commitments and the progress of the divestiture process as well as potential purchasers;

(vii) promptly report in writing to the Commission, sending the Notifying Party a non- confidential copy at the same time, if it concludes on reasonable grounds that the Notifying Party is failing to comply with these Commitments;

(viii) within one week after receipt of the documented proposal referred to in paragraph 17 of these Commitments, submit to the Commission, sending The Notifying Party a non-confidential copy at the same time, a reasoned opinion as to the suitability and independence of the proposed purchaser and the viability of the Divestment Business after the Sale and as to whether the Divestment Business is sold in a manner consistent with the conditions and obligations attached to the Decision, in particular, if relevant, whether the Sale of the Divestment Business without one or more Assets or not all of the Personnel affects the viability of the Divestment Business after the sale, taking account of the proposed purchaser;

(ix) assume the other functions assigned to the Monitoring Trustee under the conditions and obligations attached to the Decision.

28. If the Monitoring and Divestiture Trustee are not the same legal or natural persons, the Monitoring Trustee and the Divestiture Trustee shall cooperate closely with each other during and for the purpose of the preparation of the Trustee Divestiture Period in order to facilitate each other's tasks.

Duties and obligations of the Divestiture Trustee

29. Within the Trustee Divestiture Period, the Divestiture Trustee shall sell at no minimum price the Divestment Business to a purchaser, provided that the Commission has approved both the purchaser and the final binding sale and purchase agreement (and ancillary agreements) as in line with the Commission's Decision and the Commitments in accordance with paragraphs 16 and 17

6 *See* footnote 1.

of these Commitments. The Divestiture Trustee shall include in the sale and purchase agreement (as well as in any ancillary agreements) such terms and conditions as it considers appropriate for an expedient sale in the Trustee Divestiture Period. In particular, the Divestiture Trustee may include in the sale and purchase agreement such customary representations and warranties and indemnities as are reasonably required to effect the sale. The Divestiture Trustee shall protect the legitimate financial interests of the Notifying Party, subject to the Notifying Party's unconditional obligation to divest at no minimum price in the Trustee Divestiture Period.

30. In the Trustee Divestiture Period (or otherwise at the Commission's request), the Divestiture Trustee shall provide the Commission with a comprehensive monthly report written in English on the progress of the divestiture process. Such reports shall be submitted within 15 days after the end of every month with a simultaneous copy to the Monitoring Trustee and a non-confidential copy to the Notifying Party.

III. Duties and obligations of the Parties

31. The Notifying Party shall provide and shall cause its advisors to provide the Trustee with all such co-operation, assistance and information as the Trustee may reasonably require to perform its tasks. To the extent permitted by law, the Trustee shall have full and complete access to any of the Notifying Party's or the Divestment Business' books, records, documents, management or other personnel, facilities, sites and technical information necessary for fulfilling its duties under the Commitments and the Notifying Party and the Divestment Business shall provide the Trustee upon request with copies of any document. The Notifying Party and the Divestment Business shall make available to the Trustee one or more offices on their premises and shall be available for meetings in order to provide the Trustee with all information necessary for the performance of its tasks.

32. The Notifying Party shall provide the Monitoring Trustee with all managerial and administrative support that it may reasonably request on behalf of the management of the Divestment Business. This shall include all administrative support functions relating to the Divestment Business which are currently carried out at headquarters level. The Notifying Party shall provide and shall cause its advisors to provide the Monitoring Trustee, on request, with the information submitted to potential purchasers, in particular give the Monitoring Trustee access to the data room documentation and all other information granted to potential purchasers in the due diligence procedure. The Notifying Party shall inform the Monitoring Trustee on possible purchasers, submit lists of potential purchasers at each stage of the selection process, including the offers made by potential purchasers at those stages, and keep the Monitoring Trustee informed of all developments in the implementation of the divestiture process.

33. The Notifying Party shall grant or procure Affiliated Undertakings to grant comprehensive powers of attorney, duly executed, to the Divestiture Trustee to effect the sale (including ancillary agreements), the Closing and all actions and declarations which the Divestiture Trustee considers necessary or appropriate to achieve the sale and the Closing, including the appointment of advisors to assist with the sale process. Upon request of the Divestiture Trustee, the Notifying Party shall cause the documents required for effecting the sale and the Closing to be duly executed.

34. The Notifying Party shall indemnify the Trustee and its employees and agents (each an "***Indemnified Party***") and hold each Indemnified Party harmless against, and hereby agrees that an Indemnified Party shall have no liability to the Notifying Party for, any liabilities arising out of the performance of the Trustee's duties under the Commitments, except to the extent that such liabilities result from the willful default, recklessness, gross negligence or bad faith of the Trustee, its employees, agents or advisors.

35. At the expense of the Notifying Party, the Trustee may appoint advisors (in particular for corporate finance or legal advice), subject to the Notifying Party's approval (this approval not to be unreasonably withheld or delayed) if the Trustee considers the appointment of such advisors necessary or appropriate for the performance of its duties and obligations under the mandate, provided that any fees and other expenses incurred by the Trustee are reasonable. Should the Notifying Party refuse to approve the advisors proposed by the Trustee the Commission may approve the appointment of such advisors instead, after having heard the Notifying Party. Only the Trustee shall be entitled to issue instructions to the advisors. Paragraph 34 of these Commitments shall apply *mutatis mutandis*. In the Trustee Divestiture Period, the Divestiture Trustee may use advisors who served the Notifying Party during the Divestiture Period if the Divestiture Trustee considers this in the best interest of an expedient sale.

36. The Notifying Party agrees that the Commission may share Confidential Information proprietary to the Notifying Party with the Trustee. The Trustee shall not disclose such information and the principles contained in Article 17 (1) and (2) of the Merger Regulation apply *mutatis mutandis*.

37. The Notifying Party agrees that the contact details of the Monitoring Trustee are published on the website of the Commission's Directorate-General for Competition and they shall inform interested third parties, in particular any potential purchasers, of the identity and the tasks of the Monitoring Trustee.

38. For a period of 10 years from the Effective Date the Commission may request all information from the Parties that is reasonably necessary to monitor the effective implementation of these Commitments.

III. Replacement, discharge and reappointment of the Trustee

39. If the Trustee ceases to perform its functions under the Commitments or for any other good cause, including the exposure of the Trustee to a Conflict of Interest:

    (a) the Commission may, after hearing the Trustee and the Notifying Party, require the Notifying Party to replace the Trustee; or

    (b) the Notifying Party may, with the prior approval of the Commission, replace the Trustee.

40. If the Trustee is removed according to paragraph 39 of these Commitments, the Trustee may be required to continue in its function until a new Trustee is in place to whom the Trustee has effected a full handover of all relevant information. The new Trustee shall be appointed in accordance with the procedure referred to in paragraphs 18-25 of these Commitments.

41. Unless removed according to paragraph 39 of these Commitments, the Trustee shall cease to act as Trustee only after the Commission has discharged it from its duties after all the Commitments with which the Trustee has been entrusted have been implemented. However, the Commission may at any time require the reappointment of the Monitoring Trustee if it subsequently appears that the relevant remedies might not have been fully and properly implemented.

Section E. The review clause

42. The Commission may extend the time periods foreseen in the Commitments in response to a request from the Notifying Party or, in appropriate cases, on its own initiative. Where the Notifying Party requests an extension of a time period, it shall submit a reasoned request to the Commission no later than one month before the expiry of that period, showing good cause. This request shall be accompanied by a report from the Monitoring Trustee, who shall, at the same time send a non-confidential copy of the report to the Notifying Party. Only in exceptional circumstances shall the Notifying Party be entitled to request an extension within the last month of any period.

43. The Commission may further, in response to a reasoned request from the Notifying Parties showing good cause waive, modify or substitute, in exceptional circumstances, one or more of the undertakings in these Commitments. This request shall be accompanied by a report from the Monitoring Trustee, who shall, at the same time send a non-confidential copy of the report to the Notifying Party. The request shall not have the effect of suspending the application of the undertaking and, in particular, of suspending the expiry of any time period in which the undertaking has to be complied with.

Section F. Entry into force

44. The Commitments shall take effect upon the date of adoption of the Decision.

……

duly authorised for and on behalf of Harris Corporation

SCHEDULE

1. The Divestment Business has to date operated as a standalone business within the Notifying Party. Its operations are based out of a single production facility in Roanoke, Virginia, US.

2. The Divestment Business manufactures all of the Notifying Party's night vision products from this facility and the facility's sales force is responsible for all of Notifying Party's exports of night vision equipment. Before being acquired by the Notifying Party in 2015, the business operated under Exelis Inc.'s ownership for four years and under ITT Inc.'s ownership for several decades prior to that.

3. The Divestment Business is located on a land of approximately 100,760 m2. The facility covers an area of approx. 22800 m2. As of January 2019, the Divestment Business employed [approximately 500] employees.

4. The Divestment Business's past and projected turnover and EBITDA are as follows:

TABLE 1: DIVESTMENT BUSINESS FINANCIAL DATA (EUR)[8]

Metric	2017	2018	2019	2020
Turnover	[CONFIDENTIAL]	[CONFIDENTIAL]	[CONFIDENTIAL]	[CONFIDENTIAL]
EBITDA	[15-20% of Turnover]			[20-25% of Turnover]

Source: The Notifying Party

5. The Divestment Business operates as a standalone business including engineering, R&D, operations, manufacturing, business development, human resources, finance, business development, and management personnel. An organizational chart is set out below.

DIVESTMENT BUSINESS ORGANIZATIONAL CHART

[CONFIDENTIAL. The chart includes the following departments: Engineering, Operations/ Supply Chain, Manufacturing Engineering, Quality, Facilities, Business Development, Program Management/Strategy, Information Technology, HR/Security/Admin/Management, Finance and Contracts/Trade Comp/Legal.]

6. In accordance with paragraph 6 of these Commitments, the Divestment Business includes, but is not limited to:

   (a) The following main tangible assets:

   - Material real property owned and used to conduct the Divestment Business;

     Owned Real Property

[8] Figures for 2019 and 2020 are projections.

1. 7625, 7635 and 7645 Plantation Rd., Roanoke, VA (Building 1), and known as Roanoke County, VA Tax Parcel ID 027.06-05-15.00-0000.

2. 7767 Lila Drive (also known as 7667 Plantation Rd.), Roanoke, VA (Building 2), and known as Roanoke County, VA Tax Parcel ID 027.06-05-14.01-0000.

3. 7671 Elon Drive, Roanoke, VA (5.198890 acres of land and Former Building 3) and known as Roanoke County, VA Tax Parcel ID 027.10-09-03.00-0000.

Interests in Real Property

1. The following ingress and egress easements related to access of Lila Drive:

    - Private Road Easement described in Notes 6 and 7 of Instrument No. 2005-17978;
    - Agreement made by and between John William Jamison and Mary C. Jamison, and O.H. Huffman and Lila E. Huffman, dated June 10, 1958, and recorded June 17, 1958, in Deed Book 596, Page 439;
    - Ingress and Egress Easement granted to Raymond B. Huffman and Florence H. Peters disclosed by instrument recorded as Instrument Number 200605141 on April 5, 2006; and
    - Terms and conditions of Road Maintenance Agreement recorded August 5, 1998 in Book 1588 Page 465.

- Equipment, machinery, operating supplies, furniture, office equipment, data processing equipment, parts, computer equipment, computers and computer peripherals owned and primarily used in the Divestment Business. This includes PC/laptops; servers on-site; networking equipment; firewall; printers/copiers; mobile devices; voice phones and equipment.

  These tangible assets are located at 7635 Plantation Road, Roanoke, Virginia 24019, US.

(b) The following main intangible assets:

- All original business records located in Roanoke, Virginia and primarily used in the Divestment Business, other than certain excluded business records;

- Computer software owned by the Notifying Party and used primarily in the Divestment Business;

- The rights and benefits in and to contracts entered into by the Notifying Party and primarily related to the Divestment Business, including all government contracts (contracts entered with a governmental body or subcontracts or other arrangements to provide goods or services to a prime contractor, any governmental body or to a higher-tier subcontractor) and government bids (offers, quotations, bids or proposals submitted to a governmental body or any higher-tier contractor that, if accepted or awarded, would reasonably be expected to result in a government contract);

- All rights and benefits of the credits, prepaid expenses, and deposits relating to the contractual obligations to be assumed by Purchaser;

- All trade accounts and notes receivable and other miscellaneous receivables of the sellers, whether due from customers, vendors, or suppliers, that arise exclusively from the Divestment Business prior to the closing to the extent included in final working capital, but excluding any right to payment or repayment of VAT and excluding any

carve-out accounts or intercompany accounts receivable;

- Rights under express or implied warranties from suppliers of all the transferable assets, to the extent transferable and subject to third party consents and novations of government contracts;

- All rights to causes of action, guarantees, choses in action, rights of recovery, rights of set-off of any kind, lawsuits, claims, bankruptcy claims, or proofs of claims and demands of any nature in each case exclusively related to the transferred assets and the assumed liabilities;

- All copyrights owned by The Notifying Party and used primarily in the Divested Business;

- All trademarks associated with the Divestment Business (except the Harris mark), and the goodwill associated with such trademarks. These are listed in **Confidential Annex CM 3**.

- Trade secrets owned by The Notifying Party and used primarily in the Divested Business;
- Certain domain names associated with the Divestment Business. These are; dominatethedark.com; harrisnightvision.com; nightvision.com; own-the-environment.com; owntheenvironment.com; tacticalnvg.com and https://www.harris.com/what-we-do/night-vision; and

- All of the [CONFIDENTIAL NUMBER] active patents that are primarily used in the Divestment Business, among which [CONFIDENTIAL NUMBER] active patents protect core next-generation tubes technology. These are listed in **Confidential Annex CM 5**.

- In addition, Harris will grant a non-exclusive, irrevocable, perpetual, and worldwide license for no additional consideration to use in the Divestment Business any other IP assets owned by Harris as of closing of the divestment that are not transferred or otherwise provided to the buyer under the Transitional Services Agreement but that are used in the Divestment Business in the twelve months prior to closing of the divestment.[9]

(c) The following main licences, permits and authorisations:

All permits, to the extent transferable under applicable law, primarily used in the Divestment Business or for the Roanoke facility or the ownership or current operation thereof.

(d) The following main contracts, agreements, leases, commitments and understandings.

All main contracts, agreements, leases, commitments and understandings entered into by the Notifying Party and primarily related to the Divestment Business.

(e) The following customer, credit and other records:

All current customer and supplier contracts entered into by the Notifying Party and primarily related to the Divestment Business, regardless of their location. All

[9] This provision intends to cover IP assets not transferred, if any, that either are shared or otherwise used by the Divestment Business.

accounting, financial and business records of the Divestment Business, other than certain excluded business records.

(f) The following personnel:

All personnel currently working at or assigned to the Divestment Business who accept an offer of employment with the Purchaser or one of its Affiliated Undertakings.

(g) The following Key Personnel:

All key personnel currently working at the Divestment Business, as described below:

- [CONFIDENTIAL], Vice President, General Manager;
- [CONFIDENTIAL], Director, Sales;
- [CONFIDENTIAL], Senior Manager, Strategy and Development;
- [CONFIDENTIAL], Director, Program Management;
- [CONFIDENTIAL], Senior Director, Operations;
- [CONFIDENTIAL], Senior Manager, IT;
- [CONFIDENTIAL], Director, Engineering.

The Notifying Party proposes [CONFIDENTIAL] as the Hold Separate Manager of the Divestment Business.

(h) In addition, the Divestment Business includes the benefit, for a transitional period of 6 to 12 months (depending on the service concerned) after the divestment and on terms and conditions equivalent to those at present afforded to the Divestment Business, of arrangements under which the Notifying Party or its affiliated undertakings supply certain support services to the Divestment Business, unless otherwise agreed with the Purchaser. These services include general back-office business services (payroll, travel and expense administration, credit and purchasing card services, and certain *ad hoc* general back-office business services), human resources services (including access to data files, relocation services, benefit management consulting services, employee record maintenance services, and system access and maintenance services), IT services (enterprise applications, internet and employee productivity applications, connectivity, collaboration, and infrastructure services, non-recurring applications support, non-recurring connectivity, collaboration, and infrastructure support), and specified engineering services (R&D services and the delivery of wafer seal intellectual property).

7. Among other things, the Divestment Business shall not include:

a) Corporate-wide or division-wide systems, properties and assets not exclusively used in the Divestment Business and systems, properties and assets managed by the corporate-wide information technology group of the Notifying Party and its Affiliated Undertakings, including the assets that will be used by the Notifying Party to provide transitional support services to the Divestment Business;

b) any trademarks other than as set forth in **Confidential Annex CM 3**;

c) any patents other than as set forth in **Confidential Annex CM 5**;

d) any computer software, domain names, trade secrets and other intellectual property rights other than as set forth above and in the Form of Trade Secrets and Know-How Assignment (**Confidential Annex CM 7**);

e) any real property owned, operated, leased, subleased or licensed by, or for which a right to use or occupy has been granted to, the Notifying Party, other than as mentioned above.

8. LIST OF ANNEXES

Confidential Annex CM 1	Asset Purchase Agreement ("**APA**")
Confidential Annex CM 2	Form of Copyright Assignment (Exhibit B to the APA)
Confidential Annex CM 3	Assigned Trademarks (Schedule 2.1(j) to the APA)
Confidential Annex CM 4	Roanoke facility tear sheet
Confidential Annex CM 5	Assigned patents (Schedule 2.1(h) to the APA)
Confidential Annex CM 6	Form of Transition Services Agreement (Exhibit G to the APA)
Confidential Annex CM 7	Form of Trade Secrets and Know-How Assignment (Exhibit F to the APA)