DUTCH
SAFETY BOARD

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Ministry of Transport of the Russian Federation
Mr O. Storchevoy
Deputy Director, Federal Air Transport Agency
37 Leningradsky prospect
125993 MOSCOW
RUSSIAN FEDERATION

Subject Assessment of the information provided in your letter of January 14, 2016

Dear Mr Storchevoy,

The Dutch Safety Board has received your letter dated January 14, 2016 in good order and has carefully considered the subjects raised by you. For a detailed response, I refer to the Appendix to this letter.

The Dutch Safety Board concludes, with reference to paragraph 5.13 of ICAO Annex 13, that none of the information provided can be regarded as new and significant evidence.

Yours sincerely,

T.H.J. Joustra
Chairman, Dutch Safety Board

CC: M. Costa, International Civil Aviation Organization

This Appendix contains detailed responses to your given arguments. The same order is maintained as in the Attachment to your letter.

Russian Federation argumentation	Dutch Safety Board assessment
"The Ukrainian authorities deliberately concealed or distorted information on real threats to the safety of civil flights arising from the military activities of Ukraine's Ministry of Defense in abuse of Article 9 of the Chicago Convention on International Civil Aviation, Annexes 15 and 19, as well as ICAO Document 9554. As a result, other states and airlines (including Malaysia Airlines) did not have sufficient official information for making a decision to suspend flights over Ukraine." For this, five different arguments (hereunder, excl. No. 3) and one remark (No. 3) are given: 1. the closing of Ukrainian airspace; 2. the co-ordination between the civil and military air navigation service providers; 3. the statements in the report of US and NATO officials; 4. the possible presence and use of heavy anti-aircraft systems in the area; 5. the report shifts the blame and liability from Ukraine to airline operators and international organisations; 6. information regarding aircraft shot down.	For the assessment of the given five arguments and one remark of the Russian Federation, reference is made to the text in the MH17 Crash Final Report, Part B: 1. Ref.: MH17 Crash, paragraph 5.3, pages188-191: *According to the Ukrainian authorities, the shooting-down of an Antonov An-26 on July 14, 2014 and a Sukhoi Su-25 on July 16, 2014 occurred while these aeroplanes were flying beyond the effective range of MANPADS.* Ref.: MH17 Crash, paragraph 6.7, under 4, page 215: *(…) The weapon systems mentioned by the Ukrainian authorities in relation tot the shooting down of these aircraft can pose a risk to civil aeroplanes.* Ref.: MH17 Crash, paragraph 10.1, under 2.a, second bullet, page 261: *The statements made by the Ukrainian authorities in which they reported that military aeroplanes had been shot down on 14 and 16 July, and in which they mentioned weapon systems that were able to reach cruising altitude of civil aeroplanes, provided sufficient reason for closing the airspace above the eastern part of Ukraine as a precaution*. Ref.: MH17 Crash, paragraph 10.5, under 2.d, page 268: *The weapon systems mentioned by the Ukrainian authorities in relation to the shooting down of these aircraft can pose a risk to civil aeroplanes, because they are capable of reaching cruising altitude. However, no measures were taken to protect civil aeroplanes against these weapon systems.* 2. Ref.: MH17 Crash, paragraph 6.1, page 198 and figure 79 on page 199: *The civil and military air traffic services were integrated in 1999 with the installation of the 'Integrated Civil-Military ATM System of Ukraine (ICMS)' as part of the UkSATSE air traffic control service. The civil and military air traffic control services each have their own command structure, but work closely together at the operational level. This cooperation is coordinated by the Ukraerocenter (the main operational unit in ICMS) in which the two services are represented as illustrated in Figure 79.* 3. Ref.: MH17 Crash, Appendix W, in response to the comments of the Russian Federation on page 43, paragraph 3.5 in the draft Final Report, page 12: *The public statements are important for obtaining an idea of the context in which the decision-making process about the flight route and airspace management was organised.* 4. Ref.: MH17 Crash, paragraph 5.3, page 190, box: *(…) Based of information transmitted by the Ukrainian pilots, two versions are currently being considered: a shot was fired from either the Pantsir modern ground-based air defence system or the X-24 guided air-*

Russian Federation argumentation	Dutch Safety Board assessment
	to-air missile from a Russian aircraft, which could have taken off from Milyerovo Airport […]". Ref.: MH17 Crash, paragraph 5.3, page 191: *On 17 July 2014, the Ukrainian Ministry of Defence stated that, on 16 July 2014, a Sukhoi Su-25 fighter aeroplane was shot at in the Donetsk region, near the Ukrainian-Russian border (Amvrosiivka). According to Ukraine, it involved an air-to-air missile that had apparently been fired by a military aeroplane belonging tot the Russian Federation's armed forces, which was conducting border control flights. (…)* 5. Ref.: MH17 Crash, paragraph 1.2, page 16: *In accordance with Annex 13, it is not the purpose of this investigation to apportion blame or liability.* 6. Ref.: MH17 Crash, paragraph 5.3, page 189: *(...) On the same day, Ukraine's National Security and Defence Council (RNBO) published a press release that stated that the aircraft was flying at an altitude of 6,500 metres when it was hit (see the box for a literal English translation of the text).* Ref.: MH17 Crash, paragraph 5.3, page 190, box: *Statement from the RNBO Information Analysis Centre of 14 July 2014 at 17:00.* Ref.: MH17 Crash, paragraph 5.6, page 195: *(...) The information that Ukrainian authorities provided during a briefing with diplomats about the shoot-down of an Antonov An-26, (…).* Ref.: MH17 Crash, paragraph 6.6.2, page 212: *On July 14, 2014, the Ukrainian authorities announced in a press statement that an Antonov An-26 had been shot down while flying at an altitude of 6,500 metres. (...)* Ref.: MH17 Crash, paragraph 8.4.2.3, page 247: *(...) The downing of the Antonov An-26 on 14 July 2014 was also mentioned. As mentioned in Section 5, the Presidential Administration held a closed briefing for heads of the diplomatic missions in Ukraine on the same day. (...)* The Dutch Safety Board concludes that on the basis of the arguments and the remark put forward, there is no new and significant evidence.
"The new important fact is that, even assuming the aircraft was brought down by a Buk surface-to-air missile, the description of fragments provided in the report does not match the pre-formed fragments used in the 9N314M warhead."	1. For the assessment of the given arguments of the Russian Federation regarding the tests performed by the Russian Federation, reference is made to the text in the report MH17 About the investigation, Appendix L: Ref.: MH17 About the investigation, Appendix L, Response to the comments of the Russian Federation, page 101-102, under 2, third column: *(...) The test was performed in a stationary situation on the ground, which is completely different from the detonation of a warhead at an altitude of about ten kilometres. The air density at an altitude of ten*

Russian Federation argumentation	Dutch Safety Board assessment
For this the following arguments are given: 1. the tests performed by the Russian Federation; 2. the shape and weight of the fragments; 3. the chemical composition of the fragments.	*kilometres and the speeds of the missile and the aeroplane have a substantial influence on the spread of the fragments at the moment of detonation and, stemming from that, the impact, the impact pattern and the final shape and weight of the fragments.* In Appendix V of MH17 Crash is written, in response to the comments of the Russian Federation to paragraph 3.4.10 of the draft Final Report: Ref.: MH17 Crash, Appendix V, Consultation Part A: Causes of the crash, page 10/21: *(...) The test performed by the Russian Federation/JSC Concern Almaz-Antey was not announced beforehand. So formally it could not be a part of the international investigation into the crash of flight MH17, since the Dutch Safety Board and the other States did not have the opportunity to validate the test.* *It is necessary to inform the State that is conducting the investigation in advance and to send an invitation to that State and possibly to the other participating States to obtain suggestions for the conduct of the work and/or to be present at these tests or simulations.* In addition, the full scale experiments test by the Russian Federation have been assessed in the same way as above. 2. For the assessment of the given arguments of the Russian Federation regarding the shape and weight of the fragments reference is made to the text in Appendix L of 'About the investigation' of the MH17 Crash report: Ref.: MH17 About the investigation, Appendix L, Response to the comments of the Russian Federation, page 102, under 2, third column: *(...) As indicated before, the fragments' shape and weight can change as a result of the impact, among other things by deformation and the abrasion of material. The extent to which this happens strongly depends on the location where the detonation took place and on the material that the fragments impact. Therefore, the results of the tests are irreconcilable with the weight of the fragments actually found.* The same text can be found in Appendix V of the MH17 Crash report in response to the comments of the Russian Federation to Sections 2.16.1, 2.16.2, 3.4.10, 3.7.4 and 4.2 of the draft Final Report: Ref.: MH17 Crash, Appendix V, Consultation Part A: Causes of the crash, page 3-4/21, 9-10/21, 15/21 and 20/21: *Considering changes due to deformation, abrasion, chipping and shattering on explosion and impact, the bow-tie fragments found in the wreckage originally had the shape, size, and mass of the fragments used in the 9N314M warhead. These fragments are very distinct and they are found in this type of warhead.* For the assessment of the given arguments of the Russian Federation regarding the chemical composition of the fragments reference is made

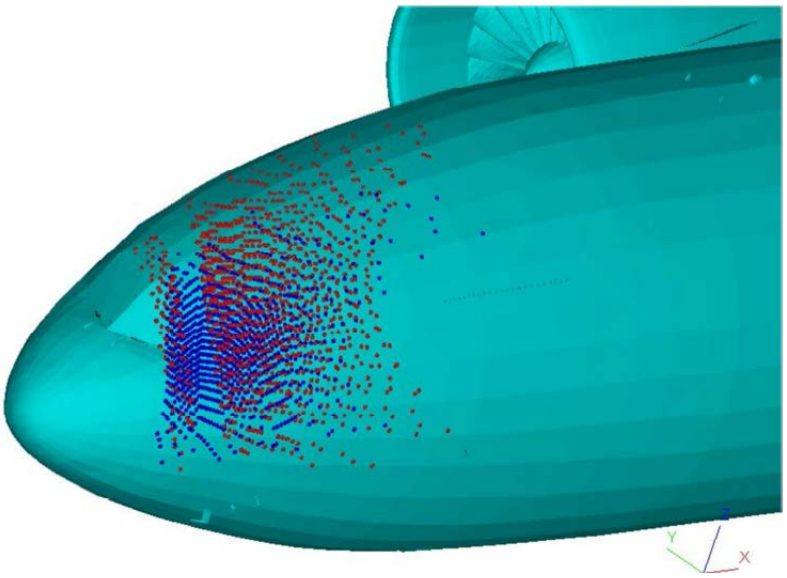
Russian Federation argumentation	Dutch Safety Board assessment
	to the text in Appendix V of the MH17 Crash report in response to the comments of the Russian Federation to paragraphs 2.16.1, 2.16.2, 3.4.10, 3.7.4 and 4.2 of the draft Final Report: Ref.: MH17Crash, Appendix V, Consultation Part A: Causes of the crash, page 3-4/21, 9-10/21, 15/21 and 20/21: *Studying the detailed chemical composition of the steel is not relevant to the investigation as the high-energy objects are usually made from low-grade metal (unalloyed steel) originating from different batches, different sources, different manufacturing locations and over different periods of time. Matching the fragments found with reference material from an intact warhead would not be possible because of these differences.* The Dutch Safety Board concludes that on the basis of the arguments put forward, there is no new and significant evidence.
"The new important fact is that, even assuming the aircraft was brought down by a Buk surface-to-air missile, penetration holes on the aircraft wreckage are not consistent with those normally created by the detonation of a 9N314M warhead." The arguments you present pertain to: 1. tests performed by the Russian Federation; 2. the penetration damage to the aircraft wreckage; 3. the presence of penetration holes in the right side of the cockpit.	1. In response to the comments of the Russian Federation on the test performed by the Russian Federation reference is made to Appendix L in MH17 About the investigation, and Appendix V in MH17 Crash, Consultation Part A: Causes of the crash. See 1 in the previous block. 2. For the response to the arguments of the Russian Federation regarding penetration damage to the wreckage reference is made to the text in section 2 of the NLR report, Appendix X of the MH17 Crash report, pages 9-28. Moreover, in response to the arguments of the Russian Federation regarding the damage to the wreckage we refer to the text in Appendix V of the MH17 Crash report in response to the comments of the Russian Federation on paragraphs 2.16.1 and 3.4.10 in the draft Final Report: Ref.: MH17 Crash, Appendix V, Consultation Part A: Causes of the crash, page 3/21 and 9/21: *(...) text (...) has been improved to include more details on the fragments expected in a 9N314M warhead and the fragments recovered from the bodies of the crew members (...) and the four distinctly shaped fragments recovered. (...) However, the reported ratios between the different shapes cannot be correlated with those fragments recovered as it is not possible to recover all of the fragments from a detonation at an altitude of 10 km. In addition, JSC Concern Almaz-Antey indicated that the actual number of pre-formed fragments differs slightly from one warhead to another during manufacture, making the ratios in the comment an approximation and not an exact set of figures.* For the response to the arguments of the Russian Federation regarding the damage to the aircraft wreckage reference is also made to the text in Appendix V of the MH17 Crash report in response to the comments of the Russian Federation on section 3.7.4 of the draft Final Report: Ref.: MH17 Crash, Appendix V, Consultation Part A: Causes of the crash, page 13/21: *With the warhead detonating at a point within the volume of space that was calculated (see paragraph 3.8.5 of the report), it is not expected that the right hand side of the cockpit would be perforated. The complex construction of the fuselage including its furnishing, instruments, equipment and the occupants in the cockpit all form barriers that reduce the speed of the fragments and prevent perforation, from the inside out, on the aeroplane's right hand side.*

Russian Federation argumentation	Dutch Safety Board assessment
	The fact that hundreds of fragments were found in the bodies of the three crew members in the cockpit illustrated that the path of the fragments was affected. 3. For the arguments regarding the presence of penetration holes in the right side of the cockpit reference is made to section 2.4, page 13 of the NLR report (Appendix X of the MH17 Crash report): *Exit damage is observed on the wreckage of the lower right-hand side of the cockpit (Figure 10). This is an indication of a direction of impact from the upper left-hand side of the cockpit towards the lower right-hand side of the cockpit.*  *Figure 10: Exit damage on lower right-hand side of the cockpit* The Dutch Safety Board concludes that on the basis of the arguments put forward, there is no new and significant evidence.
"The new important fact is that the appearance of the Section 3 encasing fragment found at the crash site does not match the appearance of fragments of the same encasing normally resulting from the detonation of a 9M38-series (9M38M1) missile."	For the response to the Russian Federation's argument regarding the so-called 'Section 3 encasing fragment' reference is made to the text in paragraph 2.12.2.8 of the MH17 Crash report: Ref.: MH17 Crash, paragraph 2.12.2.8, pages 82-83: *(…) In order to not risk impeding the criminal Investigation, the Dutch Safety Board has decided not to publish images of all of the recovered fragments that were presented to the Annex 13 partners during the progress meeting in August 2015. Images of three of the parts are shown in Figure 36.* *The shape and form of the parts recovered is consistent with a 9M38-series surface-to-air missile. Images of three of the recovered parts are shown in Figure 36 together with an indication of origin on a 9M38 series surface-to-air missile; namely an engine nozzle (1), part of one of the four stabilizer fins (2) and a data cable (3).* The text in the report makes it clear that the Dutch Safety Board makes no pronouncements as to whether the 'Section 3 encasing fragment' comes from the surface-to-air missile that downed the aeroplane. That is part of the criminal investigation.

Russian Federation argumentation	Dutch Safety Board assessment
	The Dutch Safety Board concludes that on the basis of the argument put forward, there is no new and significant evidence.
"The new important fact is that, assuming that the aircraft was indeed brought down by a Buk surface-to-air missile, the engagement conditions as presented in the report do not agree with the algorithm of the proximity fuse used in 9M38-series missiles of the Buk surface-to-air missile system."	For the response to the arguments of the Russian Federation regarding the proximity fuse reference is made to the text in Appendix L of MH17 About the investigation: Ref.: MH17 About the investigation, Appendix L, Response to the comments of the Russian Federation, page 100, under 3, third column: *The data pertaining to the sensor involved were received - through the Russian Federation - from the manufacturer of this type of missile. The data was used in new calculations and on the basis of these calculations, the Dutch Safety Board concluded that it was technically possible that a 9N314M warhead carried by a 9M38 series missile detonated in the volume of space as indicated by the Dutch Safety Board.* Furthermore, for the response to the arguments of the Russian Federation regarding the proximity fuse, reference is made to the text in Appendix V of the MH17 Crash report in response to the comments of the Russian Federation to paragraph 3.7.4 of the draft Final Report: Ref.: MH17 Crash, Appendix V, Consultation Part A: Causes of the crash, page 13/21: *On request of the Dutch Safety Board, Almaz-Antey delivered information about the operation of the detonation device. On the basis of this information, NLR concluded that the operation of the proximity fuse coincided with the calculated detonation point from NLR/TNO. (...)* The Dutch Safety Board concludes that on the basis of the argument put forward, there is no new and significant evidence.
"The new important fact is that the location of the missile in relation to the aircraft at the moment of detonation as provided in the final report does not match the fragmentation spray area on the wreckage." The arguments you present pertain to: 1. corrections to the fragmentation spray area on the Boeing 777 aircraft and the wreckage provided by Channel RT;	1. For the response to the first argument of the Russian Federation regarding this matter, reference is made to the text in Appendix L of MH17 About the investigation report: Ref.: MH17 About the investigation, Appendix L, Response to the comments of the Russian Federation, page 100, under 2, third column: *As indicated above, the stringing method that was used is not a sound method for determining an exact detonation point on the basis of impact damage. Moreover, the damage on the inside of the fuselage cannot be included in such an analysis, as the fragments of a warhead that penetrate an object do not continue in the same direction; instead, they deviate from their course and ricochet. Therefore, the trajectory that would be described by a warhead fragment inside an aeroplane's fuselage cannot be deduced and cannot be used to determine a warheads detonation location. Only the impact pattern caused by penetrations, perforations and ricochets visible on the outside can be used to determine the general origin of the fragments.*

Russian Federation argumentation	Dutch Safety Board assessment
2. the missile warhead detonation area; 3. discrepancies in static and dynamic warhead simulations.	Furthermore, for the response to the first argument of the Russian Federation, reference is made to the text in Appendix V of the MH17 Crash report in response to the Russian Federation's comments on paragraphs 2.19.4, 3.7.1 and 3.7.2 of the draft Final Report: Ref.: MH17 Crash, Appendix V, Consultation Part A: Causes of the crash, page 6/21 and 11/21: *(...) it is a well known fact in the study of terminal ballistics of fragments that a fragment hitting a plate at an oblique angel (not perpendicular to the plate) changes its direction of travel after penetration. The initial angle is typically reduced after penetration. This change in angle is dependent on several factors and can be as small as several degrees or as large as the original oblique angel. As a result, it is usually not possible to obtain accurate data on the direction of travel of fragments outside the structure by studying parts inside the structure.* With regard to the three pieces of wreckage provided by Channel RT (see photo below): These pieces of wreckage came from the upper left side of the cockpit. Two of these pieces were received in Ukraine on 30 September 2015 and the last piece was received on 3 October 2015. On 8 October these three pieces arrived at Gilze-Rijen Air Base. The Dutch Safety Board has assessed these pieces in the same manner as all the other pieces of wreckage. The damage and damage pattern of these three pieces matched the damage and damage pattern of the pieces of wreckage already recovered.  *Figure: The three pieces of wreckage provided by Channel RT, as presented (in reconstructed form) on 13 October 2015 (Source: Dutch Safety Board)* 2. For the response to the second argument of the Russian Federation regarding in this matter, reference is made to Appendix L of MH17 About the investigation report:

Russian Federation argumentation	Dutch Safety Board assessment
	Ref.: MH17 About the investigation, Appendix L, Response to the comments of the Russian Federation, pages 99-100, under 1, third column: *The method used by the Russian Federation cannot be used to determine the exact detonation location of a warhead on the basis of the impact damage caused by fragments, as the trajectory described by such fragments before and after impact is not linear. The stringing method that was used only yields a general indication of the direction from which fragments approached the aeroplane.* *In addition, the Dutch Safety Board investigated whether the detonation of a smaller warhead could have caused the damage found. TNO simulations, however, proved that the effects of the detonation of a smaller warhead at the detonation point established by the Russian Federation are not consistent with the damage pattern observed, in particular with regard to the boundaries of the impact pattern.* Furthermore, for the response to the second argument of the Russian Federation reference is made to the text in Appendix V of the MH17 Crash report in response to the comments by the Russian Federation to paragraph 3.7.3 of the draft Final Report: Ref.: MH17 Crash, Appendix V, Consultation Part A: Causes of the crash, 12/21: *(…) The comments regarding the damage to the aeroplane's structure whereby the perforation holes are almost parallel to the direction ('at the angle of 90 degrees) address an aircraft part that was photographed but was not recovered by the Dutch Safety Board. A Photo of the part is shown in paragraph 2.12.2. The image contradicts the notion that the perforation holes are at 'an angle of nearly 90 degrees'.* Furthermore, for the response to the second argument of the Russian Federation reference is made to the text in paragraph 3.8.3, page 145 of the MH17 Crash report: *TNO's simulation also showed that there is no match obtained between the observed damage on the aeroplane and the simulated damage patterns when a smaller and lighter, 40 kg, warhead was applied. Figure 60 shows the simulated damage patterns for the set of simulations with a 40 kg warhead which were closest to the actual observed damage. This pattern gave a poorer match than was obtained with a heavier warhead (Model IIb).* Furthermore, for the response to the second argument of the Russian Federation reference is made to the text in Appendix B, p. 1/7 of the TNO report (Appendix Y of the MH17 Crash report): *During the Investigation into the cause of the crash of Malaysia Airlines flight MH17 the possibility of a lighter warhead (lighter than 70 kg) was discussed. The hypothesis is that a match with the observed damage is found when a lighter warhead would detonate closer to the airplane. The DSB asked TNO to investigate this possibility.* *This appendix contains the results of the damage matching procedure for three designs of a 40 kg warhead with preformed fragments.*

Russian Federation argumentation	Dutch Safety Board assessment
	In section 5.4, pp. 22/25 - 23/25 of the TNO report (Appendix Y of the MH17 Crash report) it says: *During the Investigation the possibility of a lighter warhead (lighter than 70 kg) was discussed. The hypothesis is that a match with the observed damage is found when a lighter warhead would detonate closer to the airplane. In consultation with the DSB a simulation was set-up whereby a 40 kg warhead detonates within 1.5 m from the airplane.* *Detailed results are included in Appendix B. Three different 40 kg warhead designs (A, B, and C) with two possible terminal velocities each (500 m/s and 800 m/s) have been considered. The main difference between the designs is the range of possible fragment ejection angles (design C has the largest range). A partial match is found with design C, which moves at 500 m/s. The other designs do not match because of non-compliancy with the set conditions (see Section 5.2). Figure 5.8 illustrates the differences between the best fitting 70 kg and best fitting 40 kg warhead. The 70 kg match is better.*  *Figure 5.8: Red: fragment impacts for "best match"warhead design II (70 kg 9N314M). Blue: fragment impacts for "best match" warhead design C (hypothetical 40 kg). Design C results in a less fitting match.* *Design C is extreme, in the sense that the angular range of the fragment ejection is made as large as physically possible. Only with an extreme angular range it proves possible to remotely approximate the observed damage pattern.* *The damage pattern of a lighter warhead closer to the airplane does not resemble the damage pattern of a heavier warhead further away from the airplane. Therefore, TNO judges the hypothesis that a lighter warhead can cause the observed damage as being improbable.*

Russian Federation argumentation	Dutch Safety Board assessment
	3. For the response to the third argument of the Russian Federation in this matter, reference is made to the text in the TNO report, paragraph 4.3.2, Warhead implementations (designs), page 15/25 (Appendix Y of the MH17 Crash report): *Table 4.2 provides a summary of the most important performance differences between the designs. Design II uses the specified fragment properties and detonation position according to Almaz Antey [5]. The corresponding ejection angles and velocities of design II have been determined with the Split-X software v.5.3.1.0. Design III adopts all warhead performances according to Almaz Antey without any adaptations.* *Table 4.2: Performances of three warhead 9N314M designs. Design I is based upon national sources, design III is based upon Almaz Antey information [5]. Design II uses the geometric design according to Almaz Antey, but the corresponding ejection angles and fragment velocities are calculated by TNO.* Property / Design I / Design II / Design III Number of preformed fragments / (not available)* / 1825 *bowtie* / 1870 *bowtie* 1825 *filler* / 1870 *filler* 4093 *square* / 4100 *square* Minimal ejection angle [°]** / 72 / 76 / 68 Maximal ejection angle [°]** / 109 / 112 / 126 Lowest fragment velocity [m/s] / ~1700 / ~1300 / ~1110 Highest fragment velocity [m/s] / ~2300 / ~2520 / ~2460 Detonation position / Centre / Forward / Forward * This property is not released for publication. ** Zero degrees in longitudinal direction pointing forward. *TNO rates design II as being the most realistic for the purpose of this Investigation because of the physical basis of the design. The main difference with design III is the smaller angular range for the fragment ejection. Note that the warhead model only contains preformed fragments. Other fragments that occur with the break-up of the SAM are not included in the model.* Furthermore, for the response to the third argument of the Russian Federation reference is made to the text in the TNO report, Appendix A, Impact pattern of warhead 9N314M (Appendix Y of the MH17 Crash report) page 1/9 and 9/9: *This appendix contains the results of the damage matching procedure for three designs of the 70 kg warhead 9N314M with preformed fragments.* *(…)* *A.2 Summary* *The results are summarised in Table A.1. The best match with the observed damage on the airplane is found with desighn II and a SAM terminal velocity of 730 m/s. The poorest match is found with design III, a SAM terminal velocity of 730 m/s and the stated warhead orientation according to Almaz Antey [8].*

<table>
<tr><th>Russian Federation argumentation</th><th>Dutch Safety Board assessment</th></tr>
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Table A.1: Result of the damage matching procedure. Warhead position (X,Y, Z) and orientation (azimuth, elevation) in the reference coordinate system.
<table>
<tr><th>Simulation case</th><th>SAM terminal velocity [m/s]</th><th>X [m]</th><th>Y [m]</th><th>Z [m]</th><th>Azimuth [°]</th><th>Elevation [°]</th></tr>
<tr><td>Design I</td><td>~600</td><td>-0.4</td><td>-3.5</td><td>3.7</td><td>-17</td><td>7</td></tr>
<tr><td>Design I (alternative)</td><td>~600</td><td>-0.7</td><td>-2.0</td><td>3.5</td><td>-35</td><td>10</td></tr>
<tr><td>Design II</td><td>~600</td><td>0.0</td><td>-2.0</td><td>3.7</td><td>-30</td><td>15</td></tr>
<tr><td>Design II</td><td>730</td><td>0.0</td><td>-2.0</td><td>3.7</td><td>-27</td><td>10</td></tr>
<tr><td>Design III</td><td>~600</td><td>0.5</td><td>-2.3</td><td>3.4</td><td>-27</td><td>10</td></tr>
<tr><td>Design III</td><td>730</td><td>0.5</td><td>-2.3</td><td>3.4</td><td>-24</td><td>7</td></tr>
<tr><td>Design III (Almaz Antey)</td><td>730</td><td>1.4</td><td>-0.8</td><td>3.0</td><td>-72</td><td>22</td></tr>
</table>
The results show that:

It is possible to match different positions and orientations for different warhead designs; finding a single combination for the point of detonation and orientation is not possible.
The found detonation points are inside a limited solution space. The warhead postion changes only by a little across the different simulation cases. The results are sensitive for the warhead orientation. This is due to the close proximity of the point of detonation.

The Dutch Safety Board concludes that on the basis of the arguments put forward, there is no new and significant evidence.
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<tr><td>“The new important fact is that the location, dimensions and boundary of the damage, the number and density of penetration holes on the wreckage and especially the nature of damage to the frame of the Boeing 777 aircraft are not consistent with the warhead detonation point and missile orientation as presented in the final report. As a result, the possible launch area was calculated incorrectly.”</td><td>
For the response to the arguments of the Russian Federation regarding this point, reference is also made to the text and assessment mentioned above, as well as the text in Appendix L of MH17 About this investigation report:

Ref.: MH17 About the investigation, Appendix L, Response to the comments of the Russian Federation, page 103, third column:
The Russian Federation based its calculations on an incorrect detonation point and orientation of the weapon, resulting in an incorrect missile trajectory.

Furthermore, for the response to the arguments of the Russian Federation regarding this point, reference is made to the text in Appendix V of the MH17 Crash report in response to the Russian Federations comments on section 3.8 of the draft Final Report:

Ref.: MH17 Crash, Appendix V, Consultation Part A: Causes of the crash, page 16/21:
(…) The simulation run by JSC Concern Almaz-Antey with a launch area near Zaroshchenskoye resulted in a fly-past configuration that would create a damage pattern that did not match the observed damage on the aeroplane or the associated detonation location.

The Dutch Safety Board concludes that on the basis of the arguments put forward, there is no new and significant evidence.
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