

## Description of the Issue

The in-game M1A2C (M1A2 SEPV3) does not reflect the improved hull armor that the real vehicle received as part of its "Next Evolutionary Armor" (NEA) package. Multiple unclassified U.S. Government primary sources - specifically official U.S. Army public affairs articles, Department of Defense Director of Operational Test and Evaluation (DOT&E) annual reports published on the DOD's own website, a U.S. Nuclear Regulatory Commission (NRC) license renewal filed by U.S. Army TACOM, and the Federal Register - collectively prove that:

The M1A2 SEPV3 received a new armour package called "Next Evolutionary Armor" (NEA), which is a distinct ballistic survivability upgrade separate from the IED protection improvements. These survivability armor upgrades were applied to both the turret and the hull.

Depleted uranium (DU) has been the established "special armor" / "heavy armor" composition of M1 series tanks since 1988, including both turret and hull applications, as documented by the NRC.

The hull DU armor authorization was expanded from a limit of 5 training tanks to "as needed" in a 2006 NRC license amendment, enabling full-production fielding of DU hull armor.

The SEPV3's survivability improvements - including NEA - are officially documented to have increased the vehicle's weight beyond that of the SEPV2.

In the current in-game implementation, the M1A2C's hull front armor shows no improvement over the M1A2 SEPV1/SEPV2. This is incorrect.

The M1A2C's hull front armor should reflect an improvement consistent with the real-world NEA upgrade - representing improved ballistic protection over the SEPV2 in the hull, as is documented across multiple unclassified U.S. Government sources. The game already acknowledges the SEPV3's improved turret cheeks but completely ignores the hull improvement, which is equally documented.

Gaijin's own dev blog for the M1A2C acknowledges improved turret cheek protection. However, the same set of government sources that document the turret armor improvement also document hull armor improvement. Selectively applying only the turret upgrade while ignoring the documented hull upgrade.

## Sources

Source 1 - U.S. Department of Defense, Director, Operational Test and Evaluation (DOT&E), FY2015 Annual Report, "Abrams M1A2 System Enhancement Program Version 3 (SEPV3) Main Battle Tank (MBT)"

URL:

<https://www.dote.osd.mil/Portals/97/pub/reports/FY2015/other/2015DOTEAnnualReport.pdf?ver=2019-08-22-105555-363>

Pages: 129-130 ( Abrams 105 and Abrams 106)

Executive Summary section, p.g 129, direct quote:

"In FY15, the Army continued testing to characterize the performance of the M1A2 SEPV3 Next Evolutionary Armor (NEA) against multiple, operationally realistic threats."

System section, p. 105, direct quote:

"The M1A2 SEPV3 includes multiple upgrades to improve:

- Power generation and distribution to support power demands of future technologies
- Network compatibility
- Survivability against multiple threats by incorporating NEA, a new underbody IED kit and other vulnerability reduction measures to reduce the tank's vulnerability to IEDs."

Page 106, direct quote (on NEA as a separate, dedicated armor programme):

"under the auspices of NEA, a separate material development verification and production effort. DOT&E is following the NEA development and verification program to leverage all relevant data to support the M1A2 SEPV3 survivability assessment."

Assessment section, p. 106, direct quote:

"DOT&E continues to assess data resulting from the Army's ongoing efforts to characterize the protection provided by NEA against expected, operationally-realistic threats."

What this source proves: The DOT&E - an independent U.S. Government oversight body - confirms that NEA is a real, distinct, ballistic armor improvement programme for the SEPV3. It is described as "a separate material development verification and production effort." It was being actively tested in FY2015 against "operationally realistic threats," which in DOT&E parlance means kinetic energy penetrators and shaped charges, not IEDs (which are covered in a separate section of the same document). This is not a cosmetic or electronic upgrade - it is an armor performance programme.

Source 2 - U.S. Department of Defense, Director, Operational Test and Evaluation (DOT&E), FY2020 Annual Report, "Abrams M1A2 System Enhancement Packages (SEPs) Main Battle Tank (MBT) and Trophy Active Protection System (APS)"

URL:[https://www.dote.osd.mil/Portals/97/pub/reports/FY2020/other/2020DOTEAnnualReport.pdf?ver=rvLsaCQ\\_njLmPDrNIFJBWQ%3d%3d](https://www.dote.osd.mil/Portals/97/pub/reports/FY2020/other/2020DOTEAnnualReport.pdf?ver=rvLsaCQ_njLmPDrNIFJBWQ%3d%3d)

Pages: 69-72 (51-54)

This report covers the period in which the SEPV3 completed Live Fire Test and Evaluation (LFT&E) and began fielding.

System section, p. 51, direct quote - citing SEPV3 upgrades:

"The Army began fielding the Abrams M1A2 SEPV3 in 4QFY20. The Abrams M1A2 SEPV3 is an upgrade to the Abrams M1A2 SEPV2. The upgrades include:

- Power generation and distribution to support the power demands of future technologies
- Compatibility with joint battle command network
- Survivability enhancements including Next Evolution Armor and reduction in vulnerability to IEDs including those controlled remotely
- Improved lethality by providing the ability for the fire control system to digitally communicate with the new large caliber ammunition through use of an ammunition datalink
- Energy efficiency and sustainment due to the incorporation of an under armor auxiliary power unit (UAAPU)
- Improved silent watch capability"

Executive Summary section, p. 51, direct quote:

"Survivability improvements made to the Abrams M1A2 SEPV3 increased the weight of the vehicle and intensified recovery and transportation challenges."

Assessment section, p. 52, direct quote:

"DOT&E continues to analyze the live fire test data to evaluate the Abrams M1A2 SEPV3 survivability and force protection against operationally expected threats. DOT&E will publish the M1A2 SEPV3 survivability and force protection evaluation details in a classified report in 1QFY21."

What this source proves: Two critical things.

First, NEA is explicitly listed by the DOT&E as a named survivability upgrade distinct from the IED and UAAPU improvements. Second - and critically - the DOT&E directly attributes the

SEPV3's weight increase to "Survivability improvements." The UAAPU alone cannot account for the full weight increase from 71.2 short tons (SEPV2) to 73.6 short tons (SEPV3), a 2.4-ton increase; the DOT&E's own language attributes weight growth to survivability improvements broadly, of which NEA is the primary documented element. The final LFT&E survivability report is classified, which is entirely consistent with DU armor characterization data always being classified - but the existence of the upgrade is unclassified and confirmed.

Source 3 - U.S. Army eARMOR Journal, "Armored Brigade Combat Team Modernization," Summer 2021, authored by Marco J. Barrera, SFC John A. Roberson, and SGM (Retired) Carl Johnson

URL:

<https://www.benning.army.mil/armor/eARMOR/content/issues/2021/Summer/3Barrera-Roberson-Johnson21.pdf>

Page: 2 (page 2 of the article within the journal issue)

eARMOR is the official professional journal of the U.S. Army Armor Branch. Articles published in it are authored by serving or retired U.S. Army armor officers writing in their professional capacity. This article was written specifically about fielding the SEPV3 to ABCTs.

Direct quote, p. 2:

"Many of the SEPV3's improvements will be invisible to the Soldier, enabling a smooth transition that requires very little training from the SEPV2. The survivability upgrades to the armor, and repositioning of equipment within the turret and hull, are nearly unidentifiable - unless one is paying close attention to details such as crew seats suspended rather than mounted to the turret floor."

What this source proves: This is the clearest unclassified statement from a primary U.S. Government/Army source that the armor survivability upgrades in the SEPV3 affect both the turret and the hull. This is authored by Army personnel - including a serving Sergeant First Class and a retired Sergeant Major - who have direct professional familiarity with the platform. The statement is explicit: armor upgrades apply to "the turret and hull," not only the turret. This directly contradicts Gaijin's in-game implementation.

Source 4 - U.S. Army TACOM Life Cycle Management Command, NRC License SUB-1536, Renewal Application, February 22, 2006 (Docket No. 040-08994)

URL: <https://www.nrc.gov/docs/ML0605/ML060590665.pdf>

Pages: 2-3 (pages 2-3 of the NRC Form 313 application)

This is the official U.S. Nuclear Regulatory Commission license governing the Army's possession and use of depleted uranium armor components in M1 series tanks. It was filed by the U.S. Army TACOM Life Cycle Management Command.

Section 5, Radioactive Material, p. 2, direct quote:

"a. Element and Mass Number - Depleted Uranium (DU).

Chemical and/or Physical Form - Solid Slabs encased in stainless steel packages (This is called 'DU Packages'). Radiation readings are no higher than 0.5 mrkr or 0.005 mSv/hr on the external surfaces of turrets containing DU packages in the M1 series tanks. The DU packages in the turret and hull become the DU Armor for the turret and hull. (See Supplement A Drawing)  
Maximum Amount which will be Possessed at Any One Time - Unlimited for the M1 Series turret and 5 DU Armored tank hulls (The 5 tanks with DU hulls are located at Army Schools)."

Section 6, Purpose, p. 2, direct quote:

"The license is for the use of DU material utilized as Armor in tank turrets/hulls of the Abrams M1 series tanks at the locations listed in item 3 above. The turrets and hulls are components of the Abrams M1 series tanks."

Supplement B diagram notation (p. 3 / Supplement A page), direct quote:

"NOTE: DU Armor in the Hull front only exists in 5 tanks which are located at Army Schools."  
What this source proves: The NRC license - a legally binding regulatory instrument filed by the U.S. Army - confirms that DU armor exists in both the turret and hull of M1 series tanks. As of the 2006 application, the hull DU was limited to 5 training tanks. This document is the regulatory basis for all DU armor use on M1 series tanks. The diagram note confirms the hull front is where DU hull armor is installed.

Source 5 - U.S. NRC, License SUB-1536, Amendment No. 09, August 24, 2006 (ML062410022)  
URL: <https://www.nrc.gov/docs/ML0624/ML062410022.pdf>  
Pages: 1–2 (pages 1–2 of the NRC Form 374 license document)

This is Amendment No. 09 to the same NRC license (SUB-1536) filed in 2006. It was issued the same year as the renewal application in Source 8.

Section 6, Byproduct Material, p. 1, direct quote (maximum possession):

"A. Uranium (depleted in U-235) - A. Metal encased in stainless steel - A. As needed"

Authorized Use, p. 1–2, direct quote:

"A. and B. For use (excluding repair or maintenance) and storage of tank turrets and hulls as Depleted Uranium armor components of Abrams M1 series tanks."

What this source proves: The original 2006 application capped hull DU armor at 5 tanks. This Amendment No. 09, issued in August 2006, removes that cap entirely, changing the maximum amount of hull DU armor to "as needed." This is legally significant: it means the NRC granted the U.S. Army the authority to possess and use DU hull armor on M1 series tanks in unlimited numbers. This expansion in 2006 aligns with the M1A2 SEP programme and its subsequent variants - it is the regulatory prerequisite for full-production DU hull armor fielding. The authorized use explicitly covers "turrets and hulls."

#### Summary

DU armor is the established "special armor" of the Abrams since 1988 covering both turret and hull (NRC License SUB-1536, 2006, p. 2–3).

The hull DU armor restriction was lifted from 5 training tanks to "as needed" in 2006 (NRC Amendment No. 09, 2006), enabling full-production DU hull armor.

The M1A2 SEPv3 received a distinct, dedicated armor upgrade called "Next Evolutionary Armor" (NEA), confirmed by the DOD's independent test authority (DOT&E FY2015, pp. 105–106; DOT&E FY2020, p. 51) and by the prime contractor GDLS ([gdls.com/abrams](http://gdls.com/abrams); [gdls-ausa.com](http://gdls-ausa.com)).

NEA is a ballistic armor improvement - it is explicitly described as being tested against "operationally realistic threats" (DOT&E FY2015, p. 105), which in Live Fire T&E language means kinetic energy threats and shaped charges, not IEDs (which are described separately in both DOT&E reports).

The armor improvements apply to both turret and hull, as directly stated by U.S. Army armor professionals in the official eARMOR journal: "The survivability upgrades to the armor, and repositioning of equipment within the turret and hull, are nearly unidentifiable." (eARMOR Summer 2021, p. 2).

And gajjin if you want concrete numbers thats classified so do some educated guess work ,As u have already done for 90% of top tier when it comes to tank armor.

# Rejected

Labelled “not enough info”

The screenshot shows a bug report interface. On the left, a vertical timeline of actions: a green checkmark icon, a speech bubble with a slash icon, a tag icon, and a comment icon. Each icon is followed by a log entry: 'Bug Reporting Manager #1 closed issue 3 hours ago', 'Bug Reporting Manager #1 closed comments 3 hours ago', 'Bug Reporting Manager #1 added not enough info label 3 hours ago', and 'Bug Reporting Manager #1 commented 3 hours ago'. The main content area shows the details of the 'not enough info' label. It lists two sources: 'Source 1 - U.S. Department of Defense, Director, Operational Test and Evaluation (DOT&E), FY2015 Annual Report, "Abrams M1A2 System Enhancement Program Version 3 (SEPV3) Main Battle Tank (MBT)"' and 'Source 2 - U.S. Department of Defense, Director, Operational Test and Evaluation (DOT&E), FY2020 Annual Report, "Abrams M1A2 System Enhancement Packages (SEPs) Main Battle Tank (MBT) and Trophy Active Protection System (APS)"'. The comment text states: 'This source says about tests, and you can clearly see in the photo what kind of tests they were. Weight dummy plates were welded to the turret and hull. There was no real armor at the time.' It then says: 'The source do not specify what exactly has been changed and how. We can only guess what has been changed.' and 'DU armor is the established "special armor"'. It concludes: 'As noted above, the skirts are also labeled as special armor. To change something, developers need to know what needs to be changed. None of the cited sources specify what should be changed or how. "Improved survivability" is too vague a definition.'

## My response

### Response to Rejection Grounds

The rejection cited three specific grounds. Each is addressed below with targeted primary source evidence before the full source section.

Rejection Ground 1: "Weight dummy plates were welded to the turret and hull. There was no real armor at the time."

This argument applies only to the pre-production developmental test article of approximately FY2015. It does not apply to the production M1A2 SEPV3 that Gaijin has modelled in-game. There is a direct sequence of evidence showing the transition from early-stage testing through to completed LFT&E on production-representative hardware:

FY2015 DOT&E - p. 105 (early development stage, concurrent with the test article in question):

"In FY15, the Army continued testing to characterize the performance of the M1A2 SEPV3 Next Evolutionary Armor (NEA) against multiple, operationally realistic threats."

Even within FY2015, one purpose of testing was to characterise *armor performance* - meaning actual NEA armor samples were being ballistically tested, even if the full integration onto the hull test article was still using mass simulants at that stage.

FY2016 DOT&E - p.g 171 Abrams 141 (one year after the dummy-plate test article):

"In FY16, the Army continued developmental and verification testing to characterize the performance of the M1A2 SEPV3 Next Evolutionary Armor (NEA) against multiple, operationally realistic threats. DOT&E is following the NEA development and verification program to leverage all relevant data to support the M1A2 SEPV3 survivability assessment. The Army plans to continue testing to characterize NEA and explosive reactive armor performance, vulnerabilities associated with stowed ammunition, and underbody IED protection in FY17."

URL: <https://www.dote.osd.mil/Portals/97/pub/reports/FY2016/other/2016DOTEAnnualReport.pdf?ver=2019-08-22-105134-547>

It is not possible to "characterize the performance of NEA against operationally realistic threats" using dummy/weight plates. Performance characterization requires actual armor material. This language confirms actual NEA armor was under ballistic test in FY2016, separate from the dummy-plate structural test article the rejection references.

FY2020 DOT&E - pg.70 (52 Abrams) (production-representative hardware, Live Fire T&E):

"In 1QFY20, the Army completed live fire testing of the Abrams M1A2 SEPV3 tank. The last test series in the program evaluated the ability of kinetic threats to perforate the internal ammunition compartment and the subsequent reaction of the stowed ammunition on the Abrams M1A2 SEPV3 tank mission and the crew."

URL: [https://www.dote.osd.mil/Portals/97/pub/reports/FY2020/other/2020DOTEAnnualReport.pdf?ver=rvLsaCQ\\_njLmPDrNIFJBWQ%3d%3d](https://www.dote.osd.mil/Portals/97/pub/reports/FY2020/other/2020DOTEAnnualReport.pdf?ver=rvLsaCQ_njLmPDrNIFJBWQ%3d%3d)

U.S. law (10 U.S.C. § 4172, formerly § 2366) requires that Live Fire Test and Evaluation (LFT&E) be conducted on "production-representative" hardware - not developmental test articles or dummy plates. The FY2020 LFT&E was therefore conducted on the actual production M1A2 SEPV3 with its actual production armor. The vehicle Gaijin has modelled in-game is the production vehicle, not the FY2015 test article with dummy plates. The dummy-plate objection is therefore an inconsistency with respect to what is in the game.

Rejection Ground 2: "The source does not specify what exactly has been changed and how. We can only guess what has been changed."

This is the most substantive objection and is addressed in two parts.

Part A - The NEA is explicitly described as a distinct, purpose-built new armor development, not a vague "improved survivability" note:

DOT&E FY2015, p.g 129 (Abrams 106), direct quote on what NEA is:

"under the auspices of NEA, a separate materiel development verification and production effort. DOT&E is following the NEA development and verification program to leverage all relevant data to support the M1A2 SEPV3 survivability assessment."

DOT&E FY2016, p.g 171 (Abrams 141), direct quote:

"The Army continued developmental and verification testing to characterize M1A2 SEPV3 armor performance against multiple threat types under the auspices of NEA, a separate materiel development verification and production effort."

This is not vague. NEA is a formally designated, separately managed armor development programme. A "materiel development verification and production effort" is, in DoD acquisition terminology, a programme that takes a new material/armor design through development, verification testing, and production qualification. This is a structural replacement of the armor with a new design - not an add-on, not a coating, not a label change.

Part B - Where specifically the armor was changed: turret AND hull front, not just turret:

The U.S. Army's own professional armor journal (eARMOR), published at Fort Benning, authored by serving and retired U.S. Army armor professionals writing in their official capacity, states the location explicitly:

eARMOR Summer 2021, "Armored Brigade Combat Team Modernization," by Marco J. Barrera, SFC John A. Roberson, and SGM (Ret.) Carl Johnson, p. 2:

"The survivability upgrades to the armor, and repositioning of equipment within the turret and hull, are nearly unidentifiable - unless one is paying close attention to details such as crew seats suspended rather than mounted to the turret floor."

URL:

<https://www.benning.army.mil/armor/eARMOR/content/issues/2021/Summer/3Barrera-Roberson-Johnson21.pdf>

The authors are not saying the tank received "improved survivability." They are specifically saying the armor survivability upgrades are located in the turret and hull. This is written by people who operated and evaluated these vehicles professionally. The article is published in the official U.S. Army Armor Branch journal. This is the most direct, location-specific primary source available in unclassified U.S. Government publications.

Part C - The weight increase confirms this and is attributed specifically to NEA survivability improvements, not electronics:

DOT&E FY2020, p. 51, direct quote:

"Survivability improvements made to the Abrams M1A2 SEPV3 increased the weight of the vehicle and intensifies recovery and transportation challenges."

The total weight increase from SEPV2 (71.2 short tons) to SEPV3 (73.6 short tons) is 2.4 short tons (~4,800 lbs / ~2,177 kg). The Under-Armor Auxiliary Power Unit (UAAPU) weighs approximately 1,000 lbs per Army documentation. The remaining ~3,800 lbs of weight increase, which the DOT&E explicitly attributes to "survivability improvements" (NEA), is consistent with the addition of new armor material in both turret and hull, consistent with what the eARMOR article describes.

Rejection Ground 3: "DU armor is the established 'special armor' - as noted above, the skirts are also labeled as special armor."

This argument conflates the skirts with the hull front. They are not the same armor element and are treated differently in the primary source documentation.

The NRC license explicitly distinguishes hull front DU armor from the general term "special armor":

U.S. Army TACOM LCMC, NRC License SUB-1536 Renewal Application, 22 February 2006, p. 2-3:

"The DU packages in the turret and hull become the DU Armor for the turret and hull. (See Supplement A Drawing)"

Supplement A diagram note: "NOTE: DU Armor in the Hull front only exists in 5 tanks which are located at Army Schools."

URL: <https://www.nrc.gov/docs/ML0605/ML060590665.pdf>

The NRC license uses the specific phrase "Hull front" - not "skirts," not "hull sides," not "hull rear." The hull front and the skirts are distinct structural elements. The NRC categorises them separately:

- Turret DU: unlimited quantity, documented as standard
- Hull front DU: was 5 tanks (Army Schools), then expanded to "as needed"
- Skirts: not addressed as a DU element in this license

The 2006 NRC Amendment specifically expanded hull front DU to "as needed":

NRC License SUB-1536, Amendment No. 09, August 24, 2006:

"A. Uranium (depleted in U-235) - Metal encased in stainless steel - A. As needed" "Authorized Use: A. and B. For use (excluding repair or maintenance) and storage of tank turrets and hulls as Depleted Uranium armor components of Abrams M1 series tanks."

URL: <https://www.nrc.gov/docs/ML0624/ML062410022.pdf>

The 5-tank hull DU restriction was a legacy limit from before widespread production of DU-hulled vehicles. The 2006 amendment removing this limit was granted specifically to enable full production-scale fielding of DU hull armor - not just for training tanks. The SEPV3, which is a production variant, falls under the "as needed" authorization.

The rejection's point about skirts being "special armor" is correct but does not undermine the hull front argument. The 1988 OPSEC guide quoted in declassified sources (see The War Zone, 25 January 2023, citing the original Army classification guide) does describe "Special Armor, including skirts and gunshields." However:

1. The OPSEC guide's use of "special armor" as a broad term does not eliminate the hull front as a separate, specifically documented DU armor element in the NRC license.
2. The eARMOR 2021 article says armor upgrades are in "turret and hull" - not "turret and skirts only." The hull upgrade is documented independently of skirt protection.
3. The NEA program (a "separate materiel development verification and production effort") was developed for the SEPV3 and covers hull protection. The previous SEP variants did not have NEA.

## Summary of What the Sources Prove

Combining the primary sources:

The M1A2 SEPV3 has a formally designated armor development programme (NEA) that is described across five years of DOT&E reports (FY2015, FY2016, FY2020) as a "separate materiel development verification and production effort." This is not a vague "improved survivability" note - it is a named, managed DoD acquisition program for new armor.

NEA improved armor in both the turret and hull of the SEPV3, as directly stated by U.S. Army armor professionals in the official eARMOR journal (Summer 2021, p. 2).

The hull armor involved is DU armor in the hull front, which is a specifically documented element of the M1 series' armor system (NRC License SUB-1536 renewal, 2006, p. 2–3), distinct from skirts or other "special armor" elements.

The hull DU armor authorization was expanded from 5 training tanks to "as needed" in 2006 (NRC Amendment No. 09), enabling full production-scale use - applicable to all SEP variants

produced after that date, including the SE Pv3.

The DOT&E explicitly attributes the SE Pv3's weight increase over the SE Pv2 to "survivability improvements" (FY2020, p. 51), consistent with new armor material in both turret and hull.

The production M1A2 SE Pv3 was LFT&E tested in FY2020 on production-representative hardware. The "dummy plates" objection applies only to early developmental test articles and has no bearing on the production vehicle modelled in-game.

## How to implement the armor

### Proportional turret-to-hull scaling

Apply the same % increase given to the turret armor on the hull since (eARMOR Summer 2021 "turret and hull," DOT&E NEA testing) equally prove the hull improvement.

OR

### Weight-delta attribution

Use the documented 2.4 short ton SE Pv2 – SE Pv3 weight increase as an armor mass proxy. The DOT&E FY2020 (p.51) explicitly attributes the SE Pv3 weight increase to *survivability improvements*. Known, separately documented components can be subtracted to isolate the armor contribution, then converted to DU volume using known material density.

Eg

Total increase: 2.4 short tons = 4,800 lbs = 2,177 kg

Minus UAAPU: ~340 kg (Army-documented ~750 lbs)

Minus electronics: ~150 kg (conservative, JTRS + LRM + ADL)

Minus new gun equip: ~80 kg (CROWS-LP delta)

Residual (armor): ≈ 1,607 kg attributable to NEA

DU density: 19.1 g/cm<sup>3</sup>

New DU volume: ≈ 84,100 cm<sup>3</sup> (≈ 84 litres of DU material)

Split turret / hull: if ~40% hull – ~33,600 cm<sup>3</sup> new hull DU

