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| ONR Project assessment report  PR-01879 – Nuclear Restoration Services Limited TN Gemini - Shipment Approval in support of Harwell NMT Programme |



ONR Project Assessment Report

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**Dutyholder/Applicant**: Nuclear Restoration Services Limited

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# Executive summary

The applicant, Nuclear Restoration Services Limited (NRS), has submitted an application to ONR requesting that the Great Britain (GB) transport competent authority grants Shipment Approval of the Type B(M)F package design F/343, also named RD39 or TN Gemini for transport by road in GB. The application from NRS is for GB Shipment Approval for the full period of the package design approval F/343/B(M)F (Rev.1) to allow contingency in both the schedule and number of shipments. The shipment application is for two GB contents only of the French base certificate (contents No. 8 and contents No. 9).

The current certificate expires on 20th July 2025.

Shipment Approval is required to meet the requirements of IAEA SSR-6 paragraph 825(a) (ADR 5.1.5.1.2).These shipments are being carried out as part of the Nuclear Materials Transfer project to consolidate material present at NRS Harwell with similar material at Sellafield site. The project provides hazard reduction at the NRS Harwell site, improved long term storage and security for the material post-transfer, as well as providing substantial savings to the Nuclear Decommissioning Authority group.

This project assessment report focusses on the consignors management systems, quality plans, operating instructions and emergency arrangements.

Based on the work carried out by ONR, I consider the safety submission from the applicant to be adequate and the shipment application to be compliant with the certificate of package design approval (F/343/B(M)F (Rev.1)) and applicable transport regulations.

I recommend that the Head of Transport Competent Authority signs the following Certificate of Approval for Shipment, to be effective from 21st July 2025 and expire on 20th July 2030:

* GB/4127/B(M)FT (1) (Rev.0)

Table 1: List of abbreviations.

|  |  |
| --- | --- |
| Term/Acronym | Description |
| ADR | Agreement concerning the International Carriage of Dangerous Goods by Road |
| CA | Competent Authority |
| CLD | Concrete Lined Drums |
| CoA | Certificate of Approval |
| CR | Contact Record |
| GB | Great Britain |
| IAEA | International Atomic Energy Agency |
| IMS | Integrated Management System |
| NDA | Nuclear Decommissioning Authority |
| NRS | Nuclear Restoration Services Limited |
| ONR | Office for Nuclear Regulation |
| PAR | Project Assessment Report |
| PIM | Project Initiation Meeting |
| RGP | Relevant Good Practice |
| RI | Regulatory Issue |
| RQ | Regulatory Query |
| SQEP | Suitably Qualified and Experienced Person |
| SSR | (IAEA) Specific Safety Requirements |
| TCA | Transport Competent Authority |
| UK | United Kingdom |

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# Permission requested

1. The applicant, Nuclear Restoration Services Limited (NRS), has submitted an application to ONR (ref. [1]), requesting that the Great Britian (GB) competent authority grants Shipment Approval of the Type B(M)F package design F/343, also named RD39 or TN Gemini for transport by road in GB.
2. The application from NRS is for GB Shipment Approval for the full period of the validation of package design approval F/343/B(M)F (Rev.1) to allow contingency in both the schedule and number of shipments. The shipment approval application is for two GB contents only of the French base certificate (contents No. 8 and contents No. 9).
3. Within the framework of the clearance of the Harwell site, contents No. 8 and 9 were defined to allow the transport of some Concrete Lined Drums (CLD) containing contaminated waste.
4. The application is requesting shipment approval for transport in GB. The extant GB certificate of approval (CoA) GB/5112B/B(M)F-96T (Rev.0) is due to expire on 20th July 2025.
5. This Project Assessment Report (PAR) presents the basis of the regulatory decision by ONR, as GB Competent Authority (CA) for the civil surface transport of Class 7 (radioactive material) dangerous goods, to grant the requested certificate of approval (CoA).

# Background

1. The TN Gemini packaging, loaded with contents No. 8 and 9 of the French certificate of approval F/343/B(M)F-96T(Gab), has previously been granted the combined certificate of package design and shipment approval GB/5112B/B(M)F-96T (Rev.0) by ONR, for road transport in Great Britain as a Type B(M)F package. The design is based on the French certificate of approval due to only two of the contents of French certificate F/343/B(M)F-96T (Gab) being relevant to the United Kingdom (UK) (contents No. 8 and No. 9).
2. ONR has since provided a full validation, F/343/B(M)F-96T (Rev. 0) to a further French certificate (F/343/B(M)F-96T (Gac)) that addressed a modification to content no. 9.
3. Previously, ONR issued a combined package design and shipment approval. It was agreed during the project initiation meeting (PIM) for permissioning project PR-01207 that separate package design and shipment approval certificates would be issued. Since writing the scope for the package design approval, the strategy is now to issue a validation of the French CoA F/343/B(M)FT (Hae) for contents 8 and 9 only with other contents and shipment excluded. The shipment approval will therefore cover the two GB contents only of F/343/B(M)FT (Hae) (contents 8 and 9 of the French Certificate).
4. Shipment Approval is required to meet the requirements of IAEA SSR-6 paragraph 825(a), i.e. ADR 5.1.5.1.2(a). These shipments are being carried out as part of the Nuclear Materials Transfer (NMT) project to consolidate material present at NRS Harwell with similar material at Sellafield site. The project provides hazard reduction at the NRS Harwell site, improved long term storage and security for the material post-transfer, as well as providing substantial savings to the Nuclear Decommissioning Authority (NDA) group. Completion of this project remains one of the NDA Group Key Targets.
5. Shipment approval is required because:

* The package design does not meet the requirements of IAEA SSR-6 paragraph 663 and has only been demonstrated to an operating pressure consistent with a 21 day closure period and not the one year period as defined in IAEA SSR-6 (ref. [2]) paragraph 229. This is due to the need to prevent the generation of a flammable mixture of gases within the package containment system during shipment which would potentially be present beyond this period (i.e. during an accident scenario involving a fire with a recovery time beyond a 28 day closure period).
* The package design does not meet the requirements of IAEA SSR-6 paragraphs 639 or 666 and has only been demonstrated to operate safely for a minimum temperature of -10 °C.

1. This shipment approval is a new application and has been given a new GB certificate number which will reference GB validation certificate F/343/B(M)F (Rev.1) and not GB/5112B/B(M)F.
2. The French base certificate has been issued for 7 years and expires at the end of July 2032. In line with current ONR processes it has been agreed with the Head of Transport Competent Authority (TCA) that the shipment approval will match the GB validation of package design approval and will be approved for 5 years (until July 2030).
3. There are approximately 25 shipments planned between now and December 2026 from Harwell to Sellafield site for CLD’s.

# Assessment and inspection work carried out by ONR in consideration of this request

## Transport permissioning instruction and guidance

1. We have used ONR Instruction ONR-TCA-IN-001 “Transport Permissioning” (ref. [2]) and ONR Guidance Document ONR-TCA-GD-001 (ref. [3]) during this permissioning.

## Relevant regulations governing the transport of radioactive materials

1. Relevant international and UK regulations governing the transport of radioactive materials by road are:

* International Atomic Energy Agency (IAEA) Specific Safety Requirements (SSR)-6 (Rev. 1) “Regulations for the Safe Transport of Radioactive Material. 2018 Edition” (ref. [4]);
* United Nations Economic Commission for Europe (UNECE) “Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) 2025 Edition” (ref. [5]);
* Energy Act 2013 (ref. [6]); and
* The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 (CDG09) (ref. [7]).

## Regulatory permissioning strategy

1. In accordance with the approved regulatory permissioning strategy, ONR has carried out a proportionate permissioning assessment focussed on:

* Identification and implementation of administrative controls;
* Management systems, quality plans and emergency arrangements; and
* Actions from the most recent package design validation.

1. The shipment application has been prepared utilising the good practice in ONR Guidance Document TRA-PER-GD-014 Guidance for Applications for UK Competent Authority Approval and meets the requirements of IAEA SSR-6 paragraph 827. The content is for two furniture types (TN910 and TN920).

## TCA Dutyholder lead review

1. A dutyholder lead review has been produced (ref. [8]) as part of this permissioning. Relevant information as part of the dutyholder lead role has been used supplemented by sampling the following key areas of NRS’s safety case:

* Management systems;
* Quality plans; and
* Emergency arrangements.

1. Our inspector has previously covered NRS’ management system during:

* A “NRS Transport Arrangements & Class 7 Transport Level 4 Meeting” meeting on 4-5 September 2024 (ref. [9]); and,
* A “NRS-ONR Class 7 Dutyholder Lead” meeting on 31 October 2024 (ref. [10]).

1. These two Contact Records (CRs) refer to the management system in place at twelve of the NRS sites, including Harwell and are therefore relevant to support this permissioning.
2. There have been three Category C permissioning activities relevant to the management system which are now closed (PR-01772, PR-02039 and PR‑02170).
3. A level 3 regulatory issue (RI) (RI-11566) was previously raised due to shortfalls in compliance with CDG 2009 Schedule 2 Part 1. The applicant has addressed these shortfalls satisfactorily and the regulatory issue has been closed.
4. A series of questions were raised for discussion with the applicant at the project initiation meeting (PIM) (ref. [11]). NRS talked through their response during the PIM and later provided a response in writing to these questions which satisfied our inspector.

### Conclusion and recommendations

1. Our inspector concludes that he is satisfied that NRS is operating with an Integrated Management System (IMS) which is generally consistent with relevant good practice (RGP).
2. Our inspector considers that the NRS management system for the safe transport of radioactive material, which consists of Standard Procedures S‑075, S-142 and S-463, is adequate.
3. Our inspector is satisfied that an adequate change control procedure is in place relating to the management system for the safe transport of radioactive material.
4. Our ONR inspector is content with the two operational quality plans.
5. Our ONR inspector is content with aspects of the two consignor quality plans however considers that they should be optimised to reduce the risk of closure times greater than 14 days or transportation below -10oC. The Human Factors Inspector has a Level 4 Regulatory Issue (RI) relating to this matter (see paragraph 36).
6. Based on the recent closure of a relevant Level 3 RI and the ONR Acknowledgement of an updated “Radioactive Materials Transport Emergency Plan”, our inspector considers that adequate emergency arrangements are in place.
7. As the dutyholder lead for NRS our inspector supports ONR granting shipment approval to NRS.
8. Our ONR inspector recommends that section 3 “Management Systems” of the CoA should list:

* Nuclear Restoration Services Limited ‘Licensing/Approval of Radioactive Material Transport Packages’, Standard Procedure S-075 Issue 5, 26 February 2025;
* Nuclear Restoration Services Limited ‘Dangerous Goods (including Radioactive Materials) Transport’, Standard Procedure S-142 Issue 10, 14 February 2025; and
* Nuclear Restoration Services Limited ‘Radioactive Materials Transport Emergency Plan’, Standard Procedure S-463 Issue 6, 30 June 2025.

## Human factors assessment

1. A routine report has been produced (ref. [12]) focussing on the adequacy of the identification and implementation of the administrative controls identified by NRS to meet the shipment approval requirements.
2. Our assessor undertook a Human Factors assessment of these elements to ensure they are adequately implemented into operational practice, such that they could be reliably complied with. Our assessor considered the adequacy of the NRS Quality Plans for operation of the TN Gemini package and its consignment for transport. Our assessor also drew on discussions with the NRS transport team and the records of previous TN Gemini shipments.
3. Some areas for improvement were identified within the NRS Quality Plans to further improve reliability / reduce the risk arising from human error. These were associated with ensuring the closure time restrictions and low temperature requirements were complied with to ensure the risk arising from human error remains low.
4. However, our assessor did not judge it necessary to require improvement prior to issuing the shipment approval. This judgement was based on the following:

* The two claims are clearly defined, are not complex to fulfil and are feasible for a suitably qualified and experienced person (SQEP) to complete.
* There is positive operational history, which demonstrates that the 14-day shipment duration and 21-day closure duration has not been challenged.
* The limits associated with temperature control are only likely to be challenged in winter, therefore there is adequate time to implement improvement

1. To ensure the necessary improvements are made, our assessor has raised a level four regulatory issue (RI-12636) to track the improvements to completion.
2. Our ONR assessor recommends that from a Human Factors perspective, shipment approval for the TN Gemini package is granted.

## Previous recommendations

1. The Project Assessment Report (PAR) PR-01207 (ref. [13]) for the package design validation has several recommendations to be addressed as part of the shipment approval.

**Recommendation 1:** The project inspector for shipment approval should review the consignors arrangements in place to adhere to the requirements to transport radioactive material either after or before a minimum or maximum time in the CoA.

**Recommendation 2:** The project inspector for shipment approval should review the consignors arrangements to adhere to the activity levels greater than 3000 A2 requiring shipment approval.

1. I raised a regulatory query (RQ) (RQ-02234) to NRS requesting evidence to address the recommendations.
2. I have reviewed the response provided by NRS including specialist input from our radiation shielding assessor. It was agreed that the response provided was acceptable to close out the RQ.
3. The response has given confidence that NRS complete the necessary checks against the design approval to ensure compliance is maintained for transport operations
4. I am content that both of the above recommendations have been addressed and no further work is required.

# Matters arising from ONR’s work

1. There are no matters arising from ONR’s work.

# Conclusions

1. Based on the work carried out by ONR, I consider that the applicant has adequate arrangements in place to ensure that the administrative and operational controls in F/343/B(M)F (Rev.1), and applicable transport regulations (see section 3.2) are complied with.

# Recommendations

1. I recommend that the Head of Transport Competent Authority:

* Accepts this PAR to confirm support for the ONR technical and regulatory arguments that justify granting -shipment approval.
* Approves GB/4127/B(M)FT (1) (Rev.0) to be effective from 21st July 2025 and expire on 20th July 2030.

# References

|  |  |
| --- | --- |
| [1] | NRS, “Shipment Approval Application – Use Of TN Gemini for Shipments from NRS Harwell to Sellafield, issue 1; RMT/SHP/5112/001, WIReD: ONRW-2019369590-20249,” May 2025. |
| [2] | IAEA, “Specific Safety Requirements No. SSR-6 (Rev. 1), Regulations for the Safe Transport of Radioactive Material. 2018 Edition,” June 2018. |
| [3] | ONR, “Transport Permissioning - ONR Instruction, Issue 1; ONR-TCA-IN-001, CM9: 2022/47683,” January 2025. |
| [4] | ONR, “Transport Permissioning - ONR Guidance, Issue 1; ONR-TCA-GD-001, CM9: 2018/386305,” January 2025. |
| [5] | UNECE, “Agreement concerning the International Carriage of Dangerous Goods by Road (ADR),” 2025 Edition. |
| [6] | UK Parliament, “Energy Act 2013, 2013 Chapter 32,” London, 2013. |
| [7] | UK Parliament, “The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009, SI 2009 No. 1348,” London, 2009. |
| [8] | ONR, “Transport Competent Authority Dutyholder Lead Review, Issue 1; WIReD: ONRW-2019369590-22261,” 11th July 2025. |
| [9] | ONR, “Contact Record ONR-TD-CR-24-173, NRS Transport Arrangements & Class 7 Transport Level 4 Meeting,” (CM9 2024/42226),” 4th-5th September 2024. |
| [10] | ONR, “Contact Record ONR-TD-CR-24-253, NRS-ONR Class 7 Dutyholder Lead Meeting; (CM9 2024/50956),” 31st October 2024. |
| [11] | ONR, e-mail, "PR-01879 - TCA Dutyholder Lead Requests for Information a.-h. and NRS Response,” ONR e-mail dated 24 June 2025 and NRS response dated 25 June 2025. (ONRW-2019369590-21985). |
| [12] | ONR, “AR-01745 TN Gemini - Shipment Approval in support of Harwell NMT Programme - Human Factors Assessment, Issue 1; WIReD: ONRW-2126615823-7841,” July 2025. |
| [13] | ONR, “[PR-01207] - Validation of French Certificate of Approval [F/343/B(M)F T (Hae)] of TN Germini for contents 8 and 9 package design only, Issue 1; WIReD: ONRW-2019369590-22299,” July 2025. |