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| ONR Project assessment report  PR-02036 Mk A2 AGR Transport Flask (Design No. 2834) – Assessment of Modification N0282 Issue 2 |



ONR Project assessment report

**Project name**: PR-02036 Mk A2 AGR Transport Flask (Design No. 2834)

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**Dutyholder/Applicant**: EDF Energy Nuclear Generation Limited

**Authored by**:

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# Executive summary

This report presents the findings of the ONR assessment of Modification N0282 Issue 2 for the Mk A2 AGR transport flask, Design No. 2834 that was submitted by EDF Energy Nuclear Generation Limited (the applicant). The modification proposes the concession of two small areas of bruising adjacent to the lid seal groove of Lid Seal Member 45 (LSM 45) fitted to AGR Mk A2 AGR flask E124.

The modification was originally proposed and implemented by the applicant at Modification N0282 Issue 1 as a Category Internal (Cat I) modification. We reviewed the modification and judged that, if inadequately conceived or executed, it could have impacted on the safety performance of the package and should have been a Category B modification requiring competent authority approval. We issued an Enforcement Letter requiring it to be resubmitted as a Category B modification and subsequently approved the applicant’s safety justification for continued operation of flask E124 pending our assessment of the amended modification.

The applicant resubmitted Modification N0282 Issue 2 as a Category B modification. Based on the assessment work carried out by ONR, it is concluded that the safety claims, arguments and evidence provided by the applicant are adequate to justify the concession of areas of bruising adjacent to the lid seal groove of LSM 45.

It is recommended that ONR’s Head of Regulation for the GB Transport Competent Authority:

* accepts this report to confirm support for the ONR technical and regulatory arguments that justify granting competent authority approval of the requested Modification N0282 Issue 2; and
* grants approval of the modification by signing the competent authority approval section of the applicant’s modification sheet, Modification Number N0282 Issue 2.

Table 1: List of abbreviations.

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| Term/Acronym | Description |
| AGR | Advanced Gas-cooled Reactor |
| CA | Competent Authority |
| GB | Great Britain |
| JCO | Justification for Continued Operation |
| LSM | Lid Seal Member |
| ONR | Office for Nuclear Regulation |
| PAR | Project Assessment Report |
| RI | Regulatory Issue |
| WIReD | (ONR) Well Informed Regulatory Decisions |

Table of contents

[Executive summary 3](#_Toc205478823)

[1. Permission requested 6](#_Toc205478824)

[2. Background 6](#_Toc205478825)

[2.1. Overview of Package Design 6](#_Toc205478826)

[2.2. Regulatory History 6](#_Toc205478827)

[2.3. Purpose and Scope of Modification 7](#_Toc205478828)

[3. Assessment and inspection work carried out by ONR in consideration of this request 8](#_Toc205478829)

[3.1. Engineering Assessment 8](#_Toc205478830)

[4. Matters arising from ONR’s work 9](#_Toc205478831)

[5. Conclusions 9](#_Toc205478832)

[6. Recommendations 9](#_Toc205478833)

[References 9](#_Toc205478834)

# Permission requested

1. EDF Energy Nuclear Generation Limited (the applicant) has applied (ref. [1]) to the Office for Nuclear Regulation (ONR) as the Great Britain (GB) competent authority (CA) for approval of Modification N0282 Issue 2 to the Mk A2 AGR transport flask, Design No. 2834.
2. This Project Assessment Report (PAR) presents the basis of our regulatory decision regarding Modification N0282 Issue 2.

# Background

## Overview of Package Design

1. The GB/2834 package design is commonly known as the Mk A2 AGR transport flask and has been in operation since the 1990s. It has principally been used for the shipment of Advanced Gas-cooled Reactor (AGR) fuel from the applicant’s AGR power stations to Sellafield for storage and reprocessing, as well as transport of fuel assembly tie-bars and other non-fissile components.
2. The package design comprises a forged carbon steel flask body with attached external cooling fins, a flask lid assembly and an internal stainless steel skip (of two different designs) carrying the radioactive contents.
3. The package design has five variants:

* ‘A’ - unbottled AGR fuel elements in a 15-compartment skip;
* ‘B’ - bottled AGR fuel elements in an 8-compartment skip;
* ‘C’ - loose AGR fuel pins in slotted cans or whole/part pins, pellets and powders in debris capsules within slotted cans in an 8-compartment skip;
* ‘D’ - discharged flask; and
* 'E' - non-fissile components, e.g. irradiated tie-bars.

## Regulatory History

1. The applicant proposed Modification N0282 Issue 1 (ref. [2]) for the concession of two areas of bruising adjacent to the lid seal groove of Lid Seal Member 45 (LSM 45) fitted to Mk A2 AGR flask E124. This was self-approved and implemented by the applicant as a Category Internal (Cat I) modification. The flask was returned to service and used for the transport of AGR fuel between EDF's AGR stations and Sellafield.
2. As part of our routine review and acknowledgement of EDF's self-approved modifications, we considered Modification N0282 Issue 1 and recorded our findings in (ref. [3]). We judged that the modification was associated with the inner lid seal groove and, if inadequately conceived or executed, could have a significant impact on safety and therefore required CA approval. We judged that the modification should have been categorised as Category B because it relates to the flask LSM, which is integral to the containment of the Mk A2 AGR flask. We concluded that Modification N0282 Issue 1 had been incorrectly categorised when considered against our guidance to applicants (ref. [4]) as relevant good practice and the applicant's own arrangements.
3. We communicated our findings to the applicant and established that flask E124 was loaded at the Hartlepool AGR station and due for transport to Sellafield. We recognised the potential difficulty associated with unloading or in-transit storage and took a proportionate and enabling decision to allow completion of that transport as part of our enforcement action.
4. We issued the applicant with an Enforcement Letter (ref. [5]) requiring them to:

resubmit Modification N0282 as a Category B modification requiring competent authority approval;

provide evidence of successful leak testing of loaded flask E124 prior to consignment from Hartlepool; and

following completion of that transport, suspend operation of flask E124 until either:

* the re-submitted modification had been granted competent authority approval; or
* a safety justification for continued operation (JCO) had been submitted and approved by the competent authority.

1. The applicant submitted a JCO application for continued use of flask E124 and we approved that JCO on receipt of the re-submitted modification and subject to the applicant providing evidence of satisfactory leak testing prior to each consignment of the flask (ref. [6]).
2. We tracked and monitored the applicant’s progress via a Level 3 regulatory issue (RI-12422) which was closed on submission of Modification N0282 Issue 2.

## Purpose and Scope of Modification

1. The applicant’s modification is to allow the concession of two small areas of bruising adjacent to the lid seal groove of LSM 45, fitted to flask E124. It has been submitted as a Category B modification because of the safety impact and therefore requires CA approval under the applicant’s arrangements and in line with our guidance (ref. [4]).

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

1. In accordance with the regulatory permissioning strategy, we have carried out a targeted and proportionate assessment of the applicant’s proposed modification. Our assessment of the modification has included assessment by an engineering specialist inspector. Given the nature of this modification, no assessment was required by criticality, shielding or human factors specialist inspectors.
2. No inspection work was required to complete the permissioning requested under Modification N0282 Issue 2. We intend to inspect the applicant’s management system and Mk A2 AGR transport flask modification process as part of our assessment of Modification N0286 during 2025 (ref. [7]).

## Engineering Assessment

1. Our mechanical engineering assessment for Modification N0282 was reported in an assessment report (ref. [8]).
2. Our engineering assessor considered that the damage to LSM 45 likely occurred during flask operation and prior to the flask maintenance and inspection at Sellafield that revealed the areas of bruising. Our assessor recommended that the applicant should reinforce through additional toolbox talks the need for operators to report physical damage to transport packages when it occurs. Our assessor judged this recommendation to be satisfactorily addressed by the applicant’s response.
3. Our assessor targeted their assessment on reviewing the claims, arguments and evidence regarding the impact of the areas of bruising on the LSM face, the lid seal groove and delivery of the containment safety function.
4. Our assessor judged that any burring resulting from material displaced by the bruising could prevent contact between the LSM face and the sealing face of the flask body, potentially compromising O-ring compression and the sealing function. Our assessor established that LSM 45 had received minor dressing to the areas of bruising prior to flask E124 being returned to service. Our assessor recommended that the applicant should inspect LSM 45 and remove any burring around the areas of bruising. The applicant’s response to this recommendation was accepted by our assessor.
5. Our assessor judged that the reduced width of the lid seal groove adjacent to the areas of bruising was less than that delivered by the seal groove inserts fitted periodically along the lid seal groove, such that any localised narrowing was not detrimental to the O-ring sealing function.
6. Our assessor reviewed the package leak test data provided by the applicant as a requirement of the JCO approval and confirmed that it provided evidence of satisfactory completion of tests prior to consignment of flask E124. Our assessor reviewed the leak test specification and judged that the O-ring interspace test provides substantiation that both O-ring seals continue to provide their design safety function.
7. Our assessor recommended that Modification N0282 Issue 2 should be approved from an engineering perspective.

# Matters arising from ONR’s work

1. There are no matters arising from our assessment of this modification.

# Conclusions

1. Based on the work carried out by ONR, I conclude that the proposed modification provides an adequate justification for concession of the identified areas of bruising adjacent to the lid seal groove of LSM 45 fitted to Mk A2 AGR flask E124.

# Recommendations

1. I recommend that ONR’s Head of Regulation for the GB Transport Competent Authority:

* accepts this PAR to confirm support for the ONR technical and regulatory arguments that justify granting competent authority approval of the requested Modification N0282 Issue 2; and
* grants approval of Modification N0282 by signing the competent authority approval section of the applicant’s modification sheet, Modification Number N0282 Issue 2 (ref. [1]).

# References

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| [1] | EDF, "EDF Energy Nuclear Generation - Modification Number N282 Issue 2", March 2025, WIReD Ref: ONRW-2019369590-19067. |
| [2] | EDF, "EDF Energy Nuclear Generation - Modification Number N282 Issue 1", July 2024, WIReD Ref: ONRW-2019369590-11609. |
| [3] | ONR, WIReD Permissioning Record PR-01812. |
| [4] | ONR, TRA-PER-GD-014 Issue 4, "Guidance for Applications for UK Competent Authority Approval", October 2023, CM9 Ref: 2019/335838. |
| [5] | ONR, "The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 (as amended), Regulation 5 – Carriage to be in Accordance with ADR or RID", ONR-EL-24-45, February 2025, CM9 Ref: 2025/4690, WIReD Ref: ONRW-2019369590-17327. |
| [6] | ONR, WIReD Permissioning Record PR-02052. |
| [7] | ONR, WIReD Permissioning Record PR-01936. |
| [8] | ONR, "AR-01741 - Mechanical Engineering Assessment of Modification N0282 Issue 2", July 2025, WIReD Ref: ONRW-2126615823-8061. |