Office for Nuclear Regulation

INTERVENTION RECORD			
Unique Document ID and Revision No:	ONR-SDFW-IR-22-045 Revision 0	**TRIM Ref:**	2022/42458 (4.5.10390.)
Location and purpose of Intervention:	Springfields Fuels Limited System Based Inspection – Uranium Hexafluoride Rafts		
Inspector(s) taking part in Intervention:	[redacted]		
Date(s) of Intervention:	21-22 June 2022		

PRINCIPAL STAFF SEEN

The roles of principal staff seen, including those from licensees or other government departments (for example, the Environment Agency) seen during the visit

Record Section	Organisation	Role	Name
2.1	Springfields Fuels Ltd	[redacted]	[redacted]
2.2	Springfields Fuels Ltd	Annual Review	

(A) SYSTEM / STRUCTURES BASED INSPECTION RATINGS

Complete this section only where a System / Structures Based Inspection takes place. If Licence Condition not applicable, enter "n/a"

Record Section	System / Structures Based Inspection Details	Plan Name	Licence Condition (LC)	Rating	P/RUP*
2.1.1	Uranium Hexafluoride Rafts	Springfields	10	GREEN	P
2.1.2			23	GREEN	P
2.1.3			24	GREEN	P
2.1.4			27	N/A	P
2.1.5			28	GREEN	P
2.1.6			34	GREEN	P
Overall judgement that the System / Structure adequately fulfils the requirements of the safety case. Please delete "Yes" or "No" in the box provided as applicable.				YES	

* P = planned, RUP = reactive unplanned

(B) INTERVENTION RATINGS

Complete this section only where applicable, e.g. for a compliance inspection or assessment where the duty holder's arrangements are being rated. If not applicable, enter "n/a". Complete Part A in respect of System / Structures Based Inspection

Record Section	Intervention Details	Plan Name	LC / Series Code	Rating	P / RUP*
N/A					

* P = planned, RUP = reactive unplanned

(C) INTERVENTION RATINGS - (FOR USE ONLY BY CNS & CROSS ONR PROGRAMMES)

Complete this section only where applicable for a Security/Transport/Safeguards/Conventional Safety/Fire Inspection. If not applicable, enter "n/a". Complete Part A in respect of System / Structures Based Inspection, if applicable.

Record Section	Intervention Details	Plan Name	Series Code	Rating	P / RUP*
N/A					

* P = planned, RUP = reactive unplanned

TABLE OF CONTENTS

1 EXECUTIVE SUMMARY

1.1 Purpose of Intervention

1. This inspection on the Springfields Works nuclear site was undertaken as part of a programme of planned inspections as outlined in the Springfields Fuels Limited site inspection plan for 2022/23.

2. The purpose of the inspection was to sample the adequacy of the systems and arrangements in place for the safe handling and storage on site of uranium hexafluoride cylinders.

1.2 Interventions Carried Out by ONR

3. The system based inspection sampled the measures and arrangements in place to establish and maintain the safe storage of uranium hexafluoride in two selected designated areas of the site. The scope of the inspection encompassed the following licence conditions:

- LC10 Training
- LC23 Operating rules
- LC24 Operating Instructions
- LC28 Examination, Inspection, Maintenance and Testing
- LC34 Leakage and escape of radioactive material and radioactive waste

4. The inspection comprised a combination of plant inspection, office-based examination of procedures and records and interviews with staff.

1.3 Explanation of Judgement if Safety System Not Judged to be Adequate

5. Not Applicable.

1.4 Key Findings, Inspector's Opinions and Reasons for Judgements Made

6. The intervention looked at the safety case and the hazard associated with the potential for damage of the uranium hexafluoride cylinders during handling and from fire. In the absence of claimed safety mechanisms, devices and circuits, the intervention looked at four of the claimed passive safety features and their maintenance. The intervention then considered the safety case claims associated with the periodic examination and maintenance of the cylinders to maintain their integrity and so prevent leakage and escape of radioactive material. The training of personnel undertaking the cylinder moves on site was also inspected.

7. Based on the evidence sampled, the licensee presented a comprehensive and robust thread from the hazards identified in the safety case to the measures and arrangements in place to ensure the safe handling and storage of the uranium hexafluoride cylinders on site. The personnel interviewed during the intervention demonstrated a good knowledge and understanding of the measures and arrangements associated with the safety case claims and the associated operating rules and conditions. The plant walkdown in the two selected cylinder storage area further confirmed the findings.

8. Three opportunities for improvements have been discussed with the site and will be followed up during future routine engagements with the site.

1.5 Conclusion of Intervention

9. Based on the evidence gathered during this inspection, I consider that the licensee has made and implemented adequate arrangements to ensure the storage of uranium hexafluoride cylinders fulfils the requirements specified in the safety case.

2 RECORD

2.1 System Based Inspection of uranium hexafluoride rafts

10. This System Based Inspection on the Springfields Fuels Limited licensed nuclear site was undertaken as part of a programme of planned interventions as outlined in the Springfields inspection plan for 2022/23. The scope of the inspection is aligned to the Decommissioning, Fuel & Waste Sites: Inspection Planning Guidance 2020 – 2023 dated January 2020 specifically Table 1: S 1.1 - Criticality Control: fuel storage & handling.

11. This System Based intervention looked at the uranium hexafluoride rafts which are areas used for the receipt, dispatch and storage of cylinders of enriched and natural uranium used as feedstock to the process or for the storage of tails after processing of the cylinders usable load. The intervention sampled and considered the application of the Safety Case through the following relevant licence conditions:

- LC10 Training
- LC23 Operating rules
- LC24 Operating Instructions
- LC28 Examination, Inspection, Maintenance and Testing
- LC34 Leakage and escape of radioactive material and radioactive waste

12. No Safety Mechanisms, Device and Components are identified in this system Safety Case and therefore Licence Condition 17 was not applicable to this System Based inspection.

13. The evidence sampled during the intervention sought to assess if the preventive and protective measures identified in, adequate and up-to-date, safety cases were being implemented in practice to ensure that the plant safety performance remains tolerant to design basis events, and formed an opinion as to the extent to which the following apply:

- The fault schedule has been properly developed, relevant faults selected, and associated protective/preventive measures examined and found to be adequate.
- Operating rules and conditions were in place and operators were trained and knowledge of their application and relevance to maintain safety
- Workers are aware of which Structures, Systems and Components (SSCs) have safety functions.
- Plant maintenance and modification arrangements ensure that the functionality of Safety Systems and Components (SSCs) is not compromised.

14. During the inspection, evidence was sought that:

- The operators and maintainers are adequately trained in the operation/maintenance of the SSC (LC10).
- The limits and conditions identified in the safety case are properly implemented (LC23).
- The operators and maintainers of the SSC have adequate written instructions relating to ensuring compliance with the limits and conditions above (LC24).
- If there are safety mechanisms as part of the SSC they are properly connected and in good working order (LC27).
- The SSC is being adequately maintained (LC28).

15. This inspection was carried out against the requirements of ONR's published inspection guidance associated with the above Licence Conditions for System Based Inspections. ONR guidance used for this SBI can be found in document ONR-INSP-GD-059 Revision 8. The following Technical Inspection Guides were used as a basis of licence condition compliance:

- LC 10 - NS-INSP-GD-010 Revision 3

- LC 23 - NS-INSP-GD-023 Revision 6.1
- LC 24 - NS-INSP-GD-024 Revision 6
- LC 28 - NS-INSP-GD-028 Revision 8
- LC 34 - NS-INSP-GD-034 Revision 6

16. The inspection comprised plant inspection, office-based examination of procedures and records and interviews with staff.

17. Prior to the inspection, the following Cat B safety document:

- Operational Clearance Certificate – Hex Raft Uranium Recovery Instruction (Issue 20 dated 8/12/21)

2.1.1 LC10 Training **Rating GREEN**

18. The safety case for the facility stipulate that only trained personnel can undertake the move of uranium hexafluoride cylinders. During the plant walkdown in facility [redacted], the training records were sampled for the Deputy Plant Controller who also explained and provided the records for members of the ops team. The training records for the loading and unloading of the cylinders were examined. The training is via observation and undertaking the tasks under supervision. The team undertaking the work and providing the service to the site is stable with limited to no turnover and the operation is relatively routine. The level of experience is therefore high at this present time.

19. However, it was noted that whilst the training records were adequate and in date, the trainer had signed off the records without any comments or observations. An increase in operation and the potential for new staff to start might require a more robust system of mentoring and recording the evidence of training. A review of practices and benchmarking with other organisations where appropriate was suggested with the objective to develop if appropriate a more robust documentation of the learning and ease the training of new staff on practical tasks e.g., record of task learning progression from observing, doing under guidance and doing supervised.

20. Overall, the training records seen on site were up to date and capable to demonstrate that only Suitably Qualified and Experience Personnel are allowed to undertake work which may affect safety. The interview of the operation personnel also highlighted that there is good knowledge of the limits and conditions relevant to safety and stated in the Operational Clearance Certificate e.g., maximum lifting height of cylinders, mixing of cylinders with different enrichment.

Opportunity for Improvement 1: *Review of training practice and records with good practice to enhance the quality and reliability of SQEP personnel training.*

2.1.2 LC23 Operating rules **Rating GREEN**

21. The Continued Operation Safety Case – Hex Storage & Transport [redacted]) underpins the analysis of the fault sequence likely to lead to harm to workers and members of the public.

22. The document identifies two main fault sequences of interest to this system based inspection:

- a loss of a cylinder containment due to mechanical failure from vehicle impact or during transport on site.
- Loss of cylinder containment from a diesel fire (cylinder over pressure)

[redacted]

24. The intervention confirmed that only SQEP personnel are allowed to move cylinders on site (see section 2.1.1 LC10 training). During delivery the road vehicle is parked in a specified location on the rafts away from the stored cylinders and only SQEP personnel are allowed to unload and move cylinders within the raft area. As required by the OA, the cylinders [redacted] protecting against potential mechanical damages to this weaker part of the cylinders were fitted on the cylinders seen in storage on both rafts.

25. During the plant walk down, the records of the cylinders monthly inspection were examined and the Plant Manager explained the surveillance rota. The record showed that damages were noted by the operators and acted upon in situ e.g., evidence of cylinders painting to prevent corrosion and degradation, change of damage wood blocks supporting cylinders in storage. The two trailers used for the cylinder transport on site were seen during the plant walkdown and their latest routine Maintenance Inspection records dated 24/5/22 examined.

26. The Safety Features on [redacted] and [redacted] plinth were examined together with the records of the routine check of the drainage of the plinth confirming that the safety features and rules stated in the safety case are in place. The records sampled showed that there are regular checks to confirm their availability and performance which is conditional to the operation taking place.

27. During the discussion regarding the safety case, two recommendations were made to the site related to the site wide risk profile and the conventional safety.

28. It was noted and commented that at present the site does not have a site wide safety case. Whilst the current operations are relatively routine, the potential development and change of activities is likely to change the risk profile of the site. There is a risk for the Licensee to focus on the changes e.g., the delivery of new operations, losing the overarching visibility of the most prominent risks and/or the in-combination risks. It was therefore recommended that the site should consider an overarching site wide safety case signposting existing safety case and utilised as a live document to maintain visibility of the site risk profile moving forward.

29. The second recommendation is related to the consideration of conventional health and safety risks as part of the process to produce the safety case. Notwithstanding the requirement for conventional health and safety to be addressed at operational level, an opportunity exist for the Licensee to consider at a high level, the conventional safety risks formally as part of its arrangements. Inclusion within the safety case process could facilitate the site compliance with the requirement of the Construction Design Management Regulations by incorporating the conventional safety risks as part of the site existing arrangements.

Opportunity for improvement 2: *Consider the production of a site wide safety case to support and maintain an overarching sight of the overall risk profile including during potential changes in site operation*

Opportunity for improvement 3: *Consider the formal inclusion of high-level conventional safety risks as part of the site existing arrangements during the production of safety case*

2.1.3 LC24 Operating Instructions **Rating GREEN**

30. The licensee presented Operating Instructions relevant to the claims made in the Continued Operation Safety Case and referred to in the Operational Clearance Certificate for the monthly inspection of cylinders [redacted] and the maintenance of the rafts drains and gullies [redacted]

31. In addition, evidence was provided of the five years examination of the cylinders which substantiate further the claim that the cylinders integrity is maintained and forms part of the site compliance requirement under the Pressure System Regulations.

32. The instruction (Inspection of long term storage UF6 cylinders PSIG PS036 dated 30/08/16) is relevant to the storage of 48Y cylinders and provide the details of the inspection procedure for these cylinders in adequate details. Two good practices were noted that provide higher level of accuracy and repeatability in the inspection:

- Appendix 1 of the instruction includes clear examples of acceptable and unacceptable defects to be looking for during the cylinders inspection e.g., cylinder skirt damages.

- Appendix 2 provides illustrations of corrosion and set a condition scale ranging from 1 to 5 with 5 the highest level of external surface corrosion.

33. Based on the documents and records sampled, the site demonstrated compliance with the requirements of the Licence Condition.

2.1.4 LC28 Examination, Inspection, Maintenance and Testing **Rating GREEN**

34. The licensee provided a copy of the work order record for the last five years inspection and maintenance of:

- Inspection and repair of the rafts concrete slabs

- Inspection and repair of the 48Y cylinder trailer

- Inspection and repair of the 30A cylinder trailer

35. The record showed that the trailers and rafts were maintained at an adequate interval with a maintenance periodicity of respectively 3 and 12 months and 12 months. The records sampled showed that the defects are recorded systematically in the site Asset Management System (Maximo). The linkage between the safety case and the maintenance is through the Operational Clearance Certificate where the requirements are referenced Class 2 (slab and drainage) and Class 3 (Hex Cylinder trailers) Safety Features.

36. In addition, the record of the cylinders in long term storage were examined and two 48 inches cylinders (registration numbers 504 48 F type, and 3272 48 Y type) were looked at in situ to confirm the quality of the examination. The recording of the defect in the two engineering reports appeared to reflect accurately the condition of the cylinders. The cylinders inspection correlates to the LC24 Operating Instruction examined in section 2.1.3 LC24 Operating Instruction and support the view that maintenance and examination of safety critical

plant and equipment is undertaken by suitably qualified and experienced personnel in accordance with written instructions.

37. The evidence seen support the view that for the system inspected, the site demonstrated adequate compliance with the requirement of Licence Condition 28.

2.1.5 LC34 Leakage and escape of radioactive material and waste Rating GREEN

38. The two routine inspections of the uranium hexafluoride cylinders substantiate the view that the cylinders are maintained and examined adequately to prevent a loss of containment and escape of radioactive substance to the environment.

39. The engineering reports produced seen during the inspection are thorough and undertaken by suitably experience and experience personnel in accordance with the relevant instructions. A number of legacy cylinders are present on site and special measures are in place to ensure that their integrity is maintained until their disposal.

40. In case of leakage, as required by the safety case, instructions are in place to address immediately the release of radioactive material e.g. loss on cylinder integrity during transport.

41. The Licensee demonstrated adequate compliance with the requirements of LC34 for this system.

2.1.6 Overall Judgement and Closing Meeting YES

42. From the evidence seen on site in support to the uranium hexafluoride rafts system based inspection, the site demonstrated an adequate level of compliance with the requirements of the Licence Conditions considered and rated green.

43. The evidence seen demonstrated that there is a prominent ‘golden thread’ between the fault analysis, the requirements of the safety case and their implementations at operational level.

44. Three opportunities for improvement were made for the site to consider and will be followed up during future engagement with the site.

2.2 Springfields Fuels Limited Annual Review

45. The Springfields Fuel annual review took place on 21/6/22. Salient points are:

- The site phasing out of AGR fuel production and the development of future business opportunities entailing potentially large changes
- The difficulties to maintain the capability and capacity amid a challenging resource shortage within the nuclear industry
- The need for improvements in the management of changes in particular to address the possible change necessary to develop the site operations

3 ISSUES

3.1 Issues Raised

Where the intervention identifies a shortfall in regulatory compliance one or more issues should be raised to address the gap and brought to the attention of the duty holder/licensee. In general, these will be Category 4 issues that can be easily followed up via subsequent interventions. These issues should be recorded on the ONR Issues Database after the intervention and subsequently tracked and managed. More significant issues should be categorised higher and progressed in the usual manner. Please refer to the Regulatory Issues Management process.

No	Issue Title	Category	Issue Level	Licensee/Duty Holder Role	Owner (Inspector)	Completion / Review Date
N/A						

3.2 Issues Closed

No	Issue Title	Category	Issue Level	Licensee/Duty Holder Role	Owner (Inspector)	Completion / Review Date
N/A						

RECORD APPROVAL, SIGN-OFF AND ISSUE

RECORD APPROVAL AND SIGN-OFF

Note: Documents must be finalised on TRIM when signed-off / approved for issue.

Revision	Name	Responsibility	Executive Summary Approved	Date
0A	[redacted]	[redacted]	[redacted]	19/7/22
0	[redacted]	[redacted]	[redacted]	20/07/2022

VERSION CONTROL

Revision	Date	Description of Change
0A	15/7/22	1st draft
0	19/7/22	1st issue

CIRCULATION LIST

Electronic copy unless stated otherwise, e.g. if enforcement action is being considered hard copy records may be needed

Organisation	Name / Responsibility	Date
ONR	[redacted]	
Environment Agency	[redacted]	
[redacted]	[redacted]	

	[redacted]	