Inspection Record – Dutyholder Report			
Safeguards system-based inspection			
Inspection ID	IIS-50610	**Inspection Date(s)**	30/11/2022 For 2 Days
Dutyholder	Westinghouse Springfields	**Site**	Springfields Works
Inspection Type	Announced Planned	**Site Area / Group**	
ONR Purpose	Safeguards	**Inspection Source**	

Subject (s) of Inspection

Activity	RAG Rating
FSE 3 Competence Management	GREEN
FSE 5 Reliability, Resilience and Sustainability	GREEN
FSE 6 Measurement Programme and Control	GREEN
FSE 7 Nuclear Material Tracking	GREEN
FSE 8 Data Processing and Control	GREEN
NSR19 Reg06 - Accountancy and control of qualifying nuclear material	GREEN
NSR19 Reg09 - Operation of an accountancy and control plan	GREEN
NSR19 Reg10 - Operating records	GREEN
NSR19 Reg11 - Accounting records	GREEN
NSR19 Reg12 - Accounting reports	GREEN
NSR19 Reg20 - Weight units and categories of qualifying nuclear materials	GREEN

System (s) – where applicable

Inspector(s) taking part in Inspection

Lead Inspector

[redacted]

Attending

[redacted] [redacted] Office for Nuclear Regulation

[redacted]	[redacted]	Office for Nuclear Regulation
[redacted]	[redacted]	Office for Nuclear Regulation

This report is an automated extract of data from the ONR WIReD Inspection database.

1. Scope

1.1 Aim of Inspection

This inspection was part of a programme of planned ONR safeguards inspections at Springfields Fuels Ltd during 2022/23, developed in accordance with the Safeguards Sub-Division strategy.

This inspection was a Safeguards Systems-Based Inspection (SSBI) judging the adequacy of Systems, Structures and Components (SSCs) integral to Nuclear Material Accountancy Control and Safeguards (NMACS).

The purpose of this inspection was to gain regulatory assurance (on a sample basis) that relevant SSCs of the Springfields Fuels Ltd Oxide Fuel Complex (OFC) and finished fuel store Material Balance Area (MBA QBSP) NMACS system are fit for purpose and implemented in a proportionate and appropriate manner as required by the Nuclear Safeguards (EU Exit) Regulations 2019 (NSR19), particularly regulations 6, 9, 10, 11 (2), 12 and 20.

1.2 Inspection Scope

This inspection focussed on the following SSCs integral for NMACS in Springfields Fuels Ltd MBA QBSP, specifically the LWR flow route within QBSP:

Pellet sampling weigh scale,
LWR rod weigh scales (two scales),
Plant process control system,
LWR Rod unique identifiers,
NUMIS,
MIS system.

The intervention comprised of discussions with Springfields Fuels Ltd staff (MBA QBSP), and inspection of implementation of arrangements and procedures for those SSCs described above and a plant walkdown. I sought to draw an independent and informed regulatory judgement that those systems in place for NMACS are proportionate to and appropriate for the Basic Technical Characteristics (BTC) of the qualifying nuclear facilities, and that they are implemented, and deliver NMACS function, in-line with the claims made within the Springfields Fuels Ltd‘s Accountancy and Control Plan (ACP) and other relevant arrangements.

1.3 Relevant Regulatory Guidance

The following regulatory guidance corresponds with this inspection

Name
SAFEGUARDS TECHNICAL INSPECTION GUIDE
SAFEGUARDS TECHNICAL ASSESSMENT GUIDANCE
General Inspection Guide
ONR Nuclear Material Accountancy, Control, and Safeguards Assessment Principles (ONMACS)

2. Summary Statement

This inspection comprised of discussions with Springfields Fuels Ltd personnel, sampling of documentation, implementation of arrangements and a plant walkdown.

I identified one minor shortfall in the information described in the Basic Technical Characteristics (BTC issue 11) for the Oxide Fuel Complex (OFC) and finished fuel store (MBA QBSP). This minor shortfall is associated with the description of the LWR pellet sampling weigh scale as the “method for measurement, sampling and analysis” even though this system is no longer used for that purpose. I have captured this minor shortfall within a regulatory issue to track completion of the corrective action.
I gave five pieces of regulatory advice related to the accuracy and completeness of the BTC for QBSP, implementation of routine checks and tests of backup files, IT systems recovery procedure and auditing contractors performing backups. Regulatory advice also included longer term succession planning and review of safeguards systems and components in the BTC to ensure Safeguards personnel are aware of engineering changes.
I made two observations during the inspection noting areas of good practice.
Based on the evidence sampled, I judge that Springfields Fuels Ltd is implementing adequate arrangements to manage the competence of staff using the SSCs inspected in line with FSE 3 - competence management, FSE 5 - reliability, resilience and sustainability, FSE 6 - measurement programme and control, FSE 7 - nuclear material tracking FSE 8 - data processing and control..

3. Record & Judgement

3.1 Staff seen as part of Inspection

The following principal staff were seen as part of this inspection

Name	Role	Company
[redacted]	[redacted]	Springfields Fuels Ltd
[redacted]	[redacted]	Springfields Fuels Ltd
[redacted]	[redacted]	Springfields Fuels Ltd
[redacted]	[redacted]	Springfields Fuels Ltd
[redacted]	[redacted]	Springfields Fuels Ltd
[redacted]	[redacted]	Springfields Fuels Ltd
[redacted]	[redacted]	Springfields Fuels Ltd
[redacted]	[redacted]	Springfields Fuels Ltd

[redacted]	[redacted]	Springfields Fuels Ltd
[redacted]	[redacted]	Fujitsu
[redacted]	[redacted]	Fujitsu
[redacted]		Springfields Fuels Ltd

3.2 Record
Evidence

This inspection focussed on the following SSCs integral for NMACS in Springfields Fuels Ltd MBA QBSP, specifically the LWR flow route within QBSP:

Pellet sampling weigh scale,
LWR rod weigh scales (two scales),
Plant process control system,
LWR Rod unique identifiers,
NUMIS,
MIS system.

The relevant pieces of evidence gathered during this inspection can be found at CM9 2022/63513.

FSE 3 - Competence management
Prior to the inspection, I reviewed the roles and responsibilities sections within the Springfields Fuels Ltd's Accountancy and Control Plan (ACP, SSI 945), the accountancy and safeguards standards (SSI 532), the site instruction about duly authorised & other suitably qualified and experienced persons (SSI 207), and the site instruction about material custodians (SSI 718). They detail the competence management at Springfields Fuels Ltd. The ACP states that those who carry out nuclear material accountancy or safeguards roles must undertake appropriate training pertaining to their role. The accountancy and safeguards standards (SSI 532) detail the roles that are important to NMACS. Role Proficiency Graphs (RPG) are used to capture and track competence and training for employees with NMA responsibilities. RPGs are reviewed and updated on a regular basis, usually annually. SSI 718 detailing material custodians roles and responsibilities states that material custodians must be formally trained by the Safeguards Office and be deemed as suitably qualified and experienced by the appropriate head of operations.
The safeguards training provided to staff with NMA responsibilities was inspected in August 2021 during an SSBI (see ONR-SAF-IR-15, CM9 2021/626650) both process and content of the safeguards training were judged appropriate by ONR inspectors. As the operator confirmed during our meetings that the training process and the content of the training remain unchanged, I decided not to review them. The operator confirmed that no specific training was requested for users of the sampled SSCs before they use the SSCs. I reviewed evidence that formal roles for key NMACS personnel were in place, as required by Springfields Fuels Ltd's corporate arrangements and to meet the expectations of nuclear Material Accountancy and Control Expectation (MACE) 3.2 as detailed in the ONMACS. I sampled the following role profiles and reviewed evidence of their appointment and RPG:

Material Custodian
Deputy Material Custodian
Duly Authorised Person
2 Oxide operations team members (during building [redacted] visit)

Although RPGs are allowed 15 months between updates, the sample I saw had an update approximately every 12 months for the last 3 years. From this sample, I consider that Springfields Fuels Ltd has adequate and well implemented assessment processes in place to check the competency of key NMACS personnel and formal appointment records. Springfields Fuels Ltd stated that the “site-wide roles for SFL experts baseline document” supports the organisation capability at Springfields Fuels Ltd. I reviewed the document (SSI 791), it identifies the specific areas of expertise that are necessary to ensure Springfields Fuels Ltd can maintain adequate EHS&Q performance including compliance with the site licence and other regulatory requirements such as NSR19. It also defines roles and responsibilities due to non-specific requirements but related to the compliance with ONR information. It identifies the appointed staff for these roles. I judge the document outlines the regulatory expert roles and responsibilities for safeguards adequately.
Based on the evidence sampled at the time of the inspection, I consider that the training and assessment of personnel with a key role in the operation/use of the sampled SSCs is adequate. I also consider that Springfields Fuels Ltd has adequately implemented their arrangements to manage the competence of those with assigned NMACS roles and responsibilities in line with the claims made within the Springfields Fuels Ltd ACP.

Additionally, I viewed the Safeguards Operational Capability Index and Overall Operational effectiveness spreadsheet. These showed there were enough people to undertake the current NMACs responsibilities and that SFL were recruiting at a grass roots level, however vulnerabilities exist the singleton experienced person level. These would not be realised until someone resigns (the notice period is one month). Regulatory advice: Springfields Fuels Ltd to seriously consider how to improve the succession planning in the longer term.

FSE 5 - Reliability, resilience and sustainability
Prior to the inspection, I reviewed the relevant arrangements referenced in the Springfields Fuels Ltd’s ACP relating to FSE 5: SSI880 requirements for IT systems, SSI608 Records management, SSI866 Backup and restore, IG09-25 IT disaster recovery core procedure. I asked the operator to describe the arrangements for Examination, Inspection, Maintenance and Testing (EIMT) of the NUMIS IT system. The operator stated that Fujitsu, IT service provider, was contracted (contract UK LCA Schedule 2 scope document) for the usual EIMT, in accordance with the Springfields Fuels Ltd arrangements relating to IT systems. I held discussions with the operator and Fujitsu. The main elements of the service contract with Fujitsu were confirmed: the arrangements assure the redundancy of the IT systems; if the core IT systems servers fail, the activities are [redacted] Fujitsu stated that they proceed to a daily back up of all the IT systems on site, check the availability of the backup files and send to Springfields Fuels Ltd a daily confirmation that the backups were done by email. When I asked to Springfields Fuels Ltd if they check the backup files, they confirmed that an automated IT tool (Security Events & Incidents Manager

(SEIM) tool) undertakes a daily vulnerabilities scan to check if all the IT systems are backed up as requested, but no check is done regarding the eligibility of the files, in case they would need to use them to restore a system. No-one from Springfields Fuels Ltd had undertaken a physical check of where the back up cassettes are stored. As part of this inspection, I viewed the large double walled fire proof & flood proof safe where the cassettes are kept and took a sample of numbers from cassettes inside the safe to determine whether Fujitsu were able to identify what was on the cassettes and this was demonstrated.

The SSI 869 “Computer Systems Acquisition, Installation and Management” requires some periodic audits of the system to check their compliance with Springfields Fuels Ltd computer security instructions, policies, procedures, and standards; the service contract between Springfields Fuels Ltd states the testing of the disaster recovery procedure and annual test restores to confirm the integrity of backups. When I requested evidence of the last tests carried out, Springfields Fuels Ltd was unable to provide me with any, [redacted] Fujitsu provided me with evidence of the last real case when they implemented the procedures to restore some IT systems on 19 October 2022. I was satisfied with this evidence of their capacity to restore some of the site IT systems in a timely manner. I held discussion with the OFC and NUMIS Control System Manager, he confirmed that the risk of a disaster was assessed and rated as low. Regulatory Advice: Although Springfields Fuels Ltd has strong arrangements in place to ensure reliability and resilience of the NUMIS system, they should ensure these arrangements are implemented and consider planned, periodic testing of these arrangements. Regulatory Advice: Undertaking audits of the service provided by Fujitsu would ensure Springfields Fuels Ltd would also act more as an intelligent customer.

I queried the material custodian about the arrangements in place to ensure that the constituent parts of the NMACS regime are sustained and supported over the time to ensure it continues to achieve the required outcomes.
The OFC operates as a secured area, where the systems and assets of the fuel fabrication plant are operated locally. He stated that Springfields Fuels Ltd defines priorities and identify on the long term the financial resources needed for asset replacement. If the plant manager or the material custodian observes that an asset which is key to NMACS is beginning to fail more often, a case is opened to define how to replace the asset, according to what timeline, with what estimated budget.
To maintain the operability of the existing assets in the short term, some key parts are identified and prioritised: the priority 1 spare parts must be available and stored at the OFC by Rockwell Automation and are kept in a locked cupboard, audited monthly. The priority 2 spare parts must be available for delivery by Rockwell Automation within 24 hours and are store at their facility in Milton Keynes. I viewed the lists of priority 1 spares was able to view spares store during the plant visit.

During the plant walkdown, I sought evidence in support that the LWR rod IDs are subject to EIMT, remain reliable and resilient over the time. I held discussion with the deputy material custodian who explained that the LWR rod IDs comprise eight digit and a barcode which are not just printed but engraved prior to delivery by Westinghouse USA for a better sustainability. The ID is read by the system when introduced into the process. In case of

misreading, the engraving is inspected by the operator, if it is fine then the ID is typed manually; if it is judged as faulty, the operator excludes the rod from the process.

FSE 6 - Measurement programme and control
Prior to the inspection, I reviewed the relevant arrangements referenced in the Springfields Fuels Ltd's ACP relating to FSE 6: SSI923 about Weigh scale management, SSI639 about measurement control programmes.

The week before the inspection I was informed by Springfields Fuels Ltd that the sampled pellet sampling scale was not used anymore as nuclear accountancy weigh scale at the OFC. I asked the operator evidence of the withdrawal of this scale from the list of nuclear accountancy scales at the OFC. The material custodian showed evidence that an investigation was done in search of this scale. The investigation concluded that the scale was downgraded in 2003 to be used for basic purposes and not for the purpose of nuclear accountancy, because it began to suffer issues of communication with NUMIS. The asset is still available at the OFC. In 2003, the plant manager decided to remove this scale as the information it provided was available by other means. The nuclear material accountant confirmed that since the scale was removed, the mass of pellets sampled and sent to QBSS is reported in NUMIS and the ICR not as measured (measurement code M) but estimated (measurement code E). While this inspection didn't focus on regulation 3, it became apparent that some minor parts of the BTC were inaccurate. This is a requirement under regulation 3 of NSR19 and also under the ONMACS FSE 7. I consider this is a minor shortfall.
Regulatory Issue 11172: Springfields Fuels Ltd to review and update the BTC for the Oxide Fuel Complex and finished fuel store (MBA QBSP) as the document contains inaccurate description of the methods for measurement, sampling and analysis and details of weigh scales

During discussions it came to light that while the while the scale was identified as Nuclear Accountancy equipment and tagged as such,the engineering or maintenance decided there was a more efficient way of making a measurement and reformed the equipment without informing thesafeguards team of the change. Regulatory Advice: I advised that as part of the review of the BTC, Springfields Fuels Ltd should determine which safeguards systems and components are relevant to safeguards and ensure that maintenance and engineering are aware of safeguards interest and ensure any changes to these components are shared with safeguards.

I sought evidence in support of the implementation of the operator's arrangements to ensure appropriate performance of the rod weigh scales Mettler Toledo 670-JW007 and 670-JW008. They are used to weight the rods prior and after the rods are filled with QNM. The plant process system then makes the difference between the two measurements and log it as weight of the QNM in the rod. These scales are significant as they provide important NMACS data, their outcome could not be achieved by alternative means. I queried the reliability of these weigh scales to the material custodian and deputy material custodian, they confirmed that they were generally reliable. These systems auto calibrate every day, they are maintained and calibrated by the provider Mettler Toledo as agreed by service contract with Springfields Fuels Limited. The CMMS/Maximo system permits staff to be kept informed of the deadlines for scales calibration and current calibration status. I

was provided with screen copies of CMMS/Maximo pages demonstrating that the two rod weigh scales were referenced, and that a process was described for their calibration. I reviewed the two last calibration certificates issued by Mettler Toledo for the two rod weigh scales and the associated test weights.
When I requested the standard certificates for the two rod weigh scales. Springfields Fuels Ltd was unable to demonstrate clearly which, if any, international standards the weigh scale measurements meet. I requested the certificate of initial calibration by the provider for both scales, the operator confirmed that they were not available, because these scales were installed in the process in the 1990's by BNFL (previous licensee), prior to the handover of the site by Westinghouse and the application of their arrangements. This model of scale is no longer produced by Mettler Toledo, and the manufacturer can't demonstrate the conformity of the model with some standards as the technical documentation is not in their archives. However, Springfields Fuels Ltd could confirm what standards were met for the calibration of the assets and the associated test weights with these tracking back to national standards and provided evidence from Mettler Toledo. Considering the elements above, I judged this to be proportionate evidence.
I was broadly satisfied that the arrangements and procedures as implemented in the facility met regulatory expectations of FSE 5 and NSR19 Regulation 20.

FSE 7 - Nuclear material tracking
Prior to the inspection, I reviewed a sample of the claims in the Springfields Fuels Ltd's ACP relevant to their implementation of arrangements for FSE 7. Springfields Fuels Ltd's ACP claims that NUMIS accountancy system is used to track Qualifying Nuclear Material (QNM) moving between and within MBAs.
I asked the deputy material custodian how Springfields Fuels Ltd assures to use unique IDs. The operator explained that when an ID is logged in the system, the system operates a check with all the IDs that already exist in the system, without consideration of the type of item the ID was given to (it can be QNM of a part of assembly). The reason is that some pieces of fuel assemblies made by two different manufacturers using the same algorithm for the definition of their ID can lead them to give the same ID to two different items. The probability is very low, but that happened once at Springfields Fuels Ltd: an ID was given to a rod made by Westinghouse USA and to a Japanese top nozzle provided several years earlier. The system rejected the rod ID as it was not unique. The local arrangements state that in this case, the item with non-unique ID is withdrawn from the fabrication process. I was satisfied with this automated check that I observed as being an element of a good practice. Observation.
In OFC (MBA QBSP) I focussed on following the LWR fuel assembly production route through to shipment from the facility. I identified that Product Route Specification (PRS) 47 was used to set the production in plant.
Following discussion with the manufacturing manager and material custodian I identified that LWR fuel tracking through QBSP is a predominately automated process with unique identifiers on pins being checked at key points and automatically uploaded to MIS and then NUMIS accountancy system. The primary exclusions to this and where manual intervention is needed are:

A defect/fault is discovered, and pins require removal from process,
Complete fuel assemblies are moved to be shipped,

so this is where I focussed my attention.

I identified that this process was handled by separate staff as part of the day services function and uranic material is taken away and stored in Safe Geometry Containers (SGC) which are controlled and remain in the MBA until full.
In OFC I spoke to day services lead and requested they explain to me the procedure for controlling SGCs within OFC. In my opinion, the personnel had a clear understanding of the process and was able to identify Document OFC/SO/C148A as the written instruction. I queried the process for operators to track these moves and was provided with a detailed explanation regarding the limited access to only day services to fulfil requests for an SGC along with controls (including seals) as to who can authorise such moves. I consider this demonstration was in line with steps outlined in procedure OFC/SO/C148A.
In my opinion, the arrangements and evidence seen were in line with the expectations on NSR19 regulations 6, 9 and 10 and FSE 7.

FSE8 – Data processing and control
Prior to the inspection I reviewed a sample of the claims in the ACP relevant to Springfields Fuels Ltd's implementation of arrangements for FSE 8. I subsequently sampled the SSI 532 – Nuclear material control, accountancy and safeguards standards. The ACP includes a claim that "NUMIS contains many control features, which may be automatically imposed, including "obligations; ownership; record matching; NM description and characteristics".
I therefore focussed my inspection activities to obtain evidence in support of this NUMIS NMACS functionality claim. I also sought evidence that production of the statutory reports required by NSR19 is underpinned by suitable and sufficient operating instructions/procedures and that data reported in the statutory reports can be substantiated by suitable operating records. There is currently a level 2 regulatory issue RI10819 associated with the Springfields Fuels Ltd ACP so I did not make any further judgements with regards to this.
I met with a nuclear material accountant from the Springfields Fuels Ltd accountancy team and requested a demonstration of the NUMIS system capability to track material with Japanese ownership into and out of the pool. The nuclear material accountant was able to adequately demonstrate the system capability by walking through receipt of a batch onto site and tracking its journey through multiple MBAs before entering the bulk handling decontamination process
From the evidence sampled I judge that the NUMIS system adequately fulfils the NMACS functional requirement to produce the statutory accounting reports required by NSR19 regulations 11 & 12.
During the demonstration the nuclear material accountant was able to reference appropriate operating instructions used for the production and reconciliation of accounting reports:

Instructional guide No. 41 – Quarter end accountancy
Job aid 08: Checks on trial ICR data
Instruction No. 108 – Operation of a safeguards obligation pool account for Springfields Fuels Ltd
Accountancy guide – The Oxide Fuels Complex

Evidence of the job aid sampled, and it's associated suite of documents follows regulatory issue raised by ONR at a previous inspection.
I noted in instructional guide No.41 there is a statement suggesting that "negative

accounts are investigated and balanced to zero (unless mid campaign). To allow me to make a judgement on its adequacy and implementation I requested the nuclear material accountant provide a detailed explanation of how such an investigation would be conducted.
The nuclear material accountant explained that this procedure would depend upon whether the material was an item or bulk in process and explain the steps that he along with plant staff would take to conduct and conclude such an investigation. This account was further corroborated by plant nuclear material custodians responsible for LWR material.
From the evidence provided I am content that appropriate operating records required by regulation 10 are maintained such that the accounting report data generated by the NUMIS system can be adequately substantiated.

Judgement

Overall, based on the evidence sampled at the time of the inspection, I am satisfied that Springfields Fuels Ltd has demonstrated that the SSCs sampled are fit for purpose and being implemented in a proportionate and appropriate manner as required by the Nuclear Safeguards (EU Exit) Regulations 2019 (NSR19), particularly regulations 6, 9, 10, 11 (2), 12 and 20. The arrangements for the SSCs are being implemented as claimed within the Springfields Fuels Ltd's Accountancy and Control Plan (ACP). I identified one minor shortfall that I will raise as a level 4 regulatory issue as I consider it to be a non-compliance with NSR19 regulation 3 and ONR's regulatory expectations. The regulatory issue will be managed as part of routine activities to track Springfields Fuels Ltd's return to compliance.
I therefore consider, noting ONR guidance on inspection ratings, an inspection rating of GREEN (no formal enforcement) is appropriate.

Observations / Advice

I gave the following pieces of regulatory advice as part of this intervention:Reg advice 1: Although Springfields Fuels Ltd has strong arrangements in place to ensure reliability and resilience of their systems, they should ensure these arrangements are implemented and consider planned, periodic testing of these arrangements
Reg advice 2: Undertaking audits of the service provided by Fujitsu would ensure Springfields Fuels Ltd would also act more as an intelligent customer.
Reg advice 3: the revision of the BTC is a minor shortfall that the operator will have to address. From the discussion held with the operator and the NMA, some of the information described in the BTC would need to be improved to be more accurate or useful.
Springfields Fuels Ltd may consider the revision of the BTC as an opportunity for the Safeguards team to cooperate more with the operator so that they revise together the tables of scales, the KMP etc. contained in the document.
Reg advice 4: in terms of competence management, what Springfields Fuels Ltd does is good, particularly Operational Capability Indexes, (OCI) but Springfields Fuels Ltd may consider seriously to improve the succession planning in the longer term.
Reg advice 5: as part of the review of the BTC, Springfields Fuels Ltd should determine which safeguards systems and components are relevant to Safeguards and ensure that maintenance and engineering are aware of Safeguards interest and ensure any changes to these components are shared with Safeguards.I observed two pieces of good practice:

The automatic double check of the rod IDs that is operated by the system,The arrangements related to the lists and stocks of spare parts.

3.3 Regulatory Issues

The following regulatory issues were raised, reviewed or closed as a result of this inspection.

Issue	Title
RI-11172	SFL to review and update the BTC for the Oxide Fuel Complex and finished fuel store (MBA QBSP) as the document contains inaccurate description of the methods for measurement, sampling and analysis and details of weigh scales