

	INTERVENTION RECORD					
Unique Document ID and Revision No:	ONR-SDFW-IR-21-135 Revision 0 Ref: 2021/90628					
Location and purpose of Intervention:	Springfields Works, licensed to Springfields Fuels Limited (SFL) Control of Major Accident Hazards Inspection					
Inspector(s) taking part in Intervention:	ONR – CHS Inspector, NIHSS) ONR – Specialist Mechanical Inspector) EA – Nuclear Regulator and COMAH Specialist ONR Observer – Professional Lead - Mechanical Engineering)					
Date(s) of Intervention:	16 and 18 November 2021					

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
5	SFL	EHSQ Director	
2 - 5	SFL	COMAH Manager	
2 - 5	SFL	COMAH Liaison	
2 - 5	SFL	Environmental Manager	
2	NNL	Specialist Safety Assessor	
2 – 3, 5	SFL	Inspection Group Manager	
2 – 3, 5	SFL	Senior Authorised Person – Mechanical	
2-3,5	SFL	Mechanical Engineer (Tank farm)	
2 – 3, 5	SFL	Mechanical Engineer (OFC Conversion).	
3	SFL	Plant Manager (OFC Conversion)	
3	SFL	Plant Controller (Tank farm)	
3	SFL	Plant Manager(Tank farm)	



3	SFL	Mechanical Fitter	
3	SFL	Mechanical Support Engineer	
5	SFL	Prospect Union Safety Rep	

(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*

* P = planned, RUP = reactive unplanned

(B) INTE	RVENTION RATINGS				
Record Section	Intervention Details	Plan Name	LC / Series Code	Rating	P / RUP*
P = planned, RUP = reactive unplanned					

(C) INTERVENTION RATINGS - (FOR USE ONLY BY CNS & CROSS ONR PROGRAMMES)						
Record Section	Intervention Details	Plan Name	Series Code	Rating	P / RUP*	
Section 2	Compliance with Control of Major Accident Hazards Regulations 2015 (COMAH)	COMAH Intervention Plan Springfields Fuels Limited	502 / COMAH	Green	Ρ	

* P = planned, RUP = reactive unplanned



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1 EXECUTIVE SUMMARY

1.1 **Purpose of Intervention**

- 1.1.1 To confirm the adequacy of the management of conventional health and safety hazards at Springfields Fuels Limited (SFL). In particular to examine compliance with the Control of Major Accident Hazards Regulations 2015 (COMAH).
- 1.1.2 The inspection visit was conducted together with the Environment Agency as part of the COMAH Competent Authority (CA), to assess asset integrity management of hydrofluoric acid (HF) storage vessels and transfer pipelines. The CA also took the opportunity to provide the dutyholder with advice regarding the COMAH safety report (SR) preparation and submission.

1.2 Interventions Carried Out by ONR

- 1.2.1 A remote interaction was followed by an inspection on the site.
- 1.2.2 The key activities undertaken to judge compliance with the application of COMAH were as follows:
 - Review of COMAH asset integrity management arrangements, in relation to HF storage plant and pipeline transfer.
 - Site inspection of HF storage vessels, transfer pipeline and support structures.
 - Provide the dutyholder with an overview of SR preparation processes.

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

N/A

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

- 1.4.1 Based on the aspects examined the CA was satisfied that HF tanks and pipes are fit for purpose and meet relevant good practice; that these items undergo appropriate examination, inspection, maintenance, testing and that responsible staff are suitably qualified and experienced personnel. The CA was satisfied that HF pipeline shortfalls identified by SFL are being addressed.
- 1.4.2 Overall, within the areas sampled the CA established that major accident hazards associated with loss of containment are being adequately controlled.



1.4.3 The CA offered the following advice during the inspection:

- The dutyholder should assure itself that older tanks, where design information may be scarce, are still fit for purpose and risk is as low as reasonably practicable (ALARP).
- SFL should ensure that lifting equipment is stored in accordance with their arrangements and lifting beams are marked with the safe working load.
- SFL should repair the rip at the base of the HF splash curtain or alternatively install a replacement.
- SFL should ensure that worn labels are replaced before they become illegible.
- SFL should more closely manage actions to a timely conclusion where these actions offer improvements and strengthen ALARP justifications.
- 1.4.4 During the walk down, CA identified staff were operating two computer-based process control systems within the tank farm control room. CA considered this arrangement to be in need of improvement and informed the dutyholder.
- 1.4.5 CA took the opportunity to provide the dutyholder with information regarding the COMAH safety report (SR) pre-receipt activities and agreed to timetable a discussion in early 2022 to address SR submission and pre-receipt in greater depth.

1.5 **Conclusion of Intervention**

1.5.1 Overall the arrangements were judged to be adequate, although some aspects were below the standard expected. The dutyholder undertook to address these matters, which will be followed up in future inspections.



2 RECORD

2.1 **Purpose of the Intervention:**

- 2.1.1 To provide regulatory confidence, in management system arrangements associated with the storage and pipeline transfer of COMAH hazard substance HF. In addition, to provide SFL with information and guidance regarding the safety report preparation and submission process.
- 2.1.2 The intervention consisted of discussion with company personnel, documentation review and site inspection.

2.2 Key Locations Visited:

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- External stock tanks
- Tank farm HF storage tanks
- Transfer pipeline from OFC to the tank farm and tanker loading bay
- 2.2.1 The inspection agenda prepared by ONR as part of the COMAH CA (CM9 2021/88891) identifies key topic areas and activities undertaken during the intervention. Supporting documentation provided by SFL and referenced within relevant sections of the report is saved in CM9 folder 4.3.759. This folder will also contain CA inspection report prepared by the Environment Agency and follow up correspondence with SFL in relation to the intervention.
- 2.2.2 A walk-down of the OFC stock tanks, transfer pipeline and tank farm was undertaken to sample bulk storage, pipeline and secondary containment conditions, including support structures. The report is structured in terms of the main topic areas covered during the intervention.
- 2.2.3 Regulatory opinion was based on determining compliance with the Control of Major Accident Hazards Regulations 2015 (COMAH), the Provision and Use of Work Equipment Regulations 1998 (PUWER) and Lifting Operations and Lifting Equipment Regulations 1998 (LOLER).

2.3 HF Storage and Transfer – Management System Arrangements

2.3.1 As part of the remote intervention, SFL shared a presentation describing the oxide fuels complex production process (CM9 2021/84876). This included the handling of concentrated hydrofluoric acid (CHF) and dilute hydrofluoric acid (DHF). Through the presentation, SFL was able to provide some plant familiarisation by sharing photographs and engineering drawings. For the specific areas sampled, the dutyholder described loss of containment major accident scenarios alongside fault sequences (vessel failure, overpressure, under pressure, overfilling, pipework failure or leakage) linked to engineering safety measures.



- 2.3.2 CA Mechanical Engineering Specialist (ME) explored chemo-toxic methodology and other relevant information regarding safety function classification (SFC). Specifically, the connection between risk/frequency and classes 1, 2 or 3.
- 2.3.3 SFL supplied Sellafield document (CM9 2021/84876), which provides the necessary classification definitions. This was a 2002 BNFL document and ME queried how it was kept under review/revision. SFL responded that there is an agreement with Sellafield Ltd to provide updates when necessary. ME was satisfied with this explanation.
- 2.3.4 SFL use slightly different abbreviations than Sellafield Ltd and may also use a 'c' suffix to denote 'non radiological', for example:
 - Operating Rules ORL(c);
 - Operating Instruction (Requirement) ORQ(c);
 - Operating Assumption OA;
 - Safety Mechanism SM(c);
 - Safety Related Equipment (Item) SRI; and
 - Safety Feature (SF).
- 2.3.5 In addition, CA reviewed EIMT of Equipment Which has an Effect on safety'. It was noted that Safety Features are passive features and are classified for non-radiological effects: C3 a feature the failure of which would result in serious harm to a member of the workforce or the public; and C2 a feature the failure of which would result in the death of a member of the workforce or serious danger to the public.
- 2.3.6 To seek assurance that risks are managed ALARP, ME sought a copy of optioneering review documentation. As requested, SFL supplied a number of supporting documents by email (2021/84876) including:
 - Improvement Activity Action Reports; and
 - Sellafield Ltd Technical Guide C1.30 Accident ALARP, Shortfalls & Recommendations and Outstanding Issues.
- 2.3.7 In relation to tank farm, ME noted three actions had been completed, whilst six remained open. ME asked SFL to provide information regarding how the actions were being managed, tracked and closed out. For example, using an action plan with dates, priorities and owners identified. SFL supplied extracts of the relevant action tracker to the CA by email (2021/91562 refers).
- 2.3.8 Within the action tracker document, CA observed the action owner column is populated solely with first names, some 'Date started' boxes were blank and there was no priority assigned to individual actions. ME explained there was opportunity to improve action management and suggested prioritisation to



improve the management of the most significant tasks to ensure timely and successful completion.

2.3.9 ME sought information on how SFL learn from operational experience (OPEX) and relevant incidents, including the management of internal events. As requested, SFL supplied SPM log index, detailing and fine HF or mechanical relevant incidents, specifically categories of higher significance (CM9 2021/84876). ME sampled this document and noted that there seemed to be a repeat incident with a SM failure for a HF Tanker High Level) with alignment issues on 17/6/21 and 22/7/21. This issue was discussed with the dutyholder and given the description of incidents provided, ME established the incidents were separate alignment issues and not reoccurring incidents.

2.4 HF Asset Integrity Management Systems

- 2.4.1 Engineering line drawings of HF plant provided as part of the SFL presentation were reviewed. From these drawings a sample of instrumentation was selected for SFL to supply further examination, inspection, maintenance and testing (EIMT) records. Specifically: high pressure trip
- 2.4.2 It was noted that there were no temperature indicators marked in the diagrams yet it was known that the tanks steel (e.g. #2 DHF stock tank **1**,) had an upper **1**, as afe limit. It was also suggested that the system should have a lower limit but this limit was not noted in the design records. SFL advised that temperature instrumentation exists and supplied 'Calibration and functional testing of the temperature trip alarms **1**, Revision 4 in email (CM9 2021/85427). It was noted that the instruments are SRI and trip at **1**. There was, however, no low temperature trip and this may be an oversight for brittle fracture given that some design information is estimated (see para 2.4.5).
- 2.4.3 SFL supplied (email CM9 2021/85427) maintenance instructions for both these instruments, Local Engineering Instructions, Pressure Transmitters,

These documents were sampled and judged to be adequate regarding instrument maintenance instructions. CA has not received records demonstrating the completion of maintenance on time and to the correct standard for the instruments identified above. This may have been an oversight by the dutyholder and CA will obtain this information through existing communication channels.

2.4.4 Part of the HF transfer pipeline and pipe bridge between was subject to a drone survey. SFL provided the resulting report to the CA, which contained 12 'findings'. ME sampled item 10, which states 'Pipe support – A number of drop rods showing signs of heavy corrosion along pipe bridge road crossing near ME



> queried how these findings were dealt with. SFL responded that the drone survey was an addition to routine EIMT activities and the findings are fed into EIMT observations and prioritised accordingly. ME was satisfied with this explanation.

- 2.4.5 SFL provided written schemes of examination (WSE) for HF assets within WSE documentation was sampled and found to adequately cover instructions to examine the assets in question. ME explored records for MSE asked where is the comparison against modern standards (it should be in the Periodic Safety Review) and any necessary ALARP argument as to why the tank is still fit for purpose? Of note is that there is no radiography of the tank so there is no evidence to support the quality of any welds. As a comparison No 1 DHF Stock Tank was installed in 1986 and designed to BS 5500 Cat 1 (1985) and underwent 100% radiography. See also paragraph 2.4.2 regarding temperature measuring instrumentation.
- 2.4.6 CA conducted a review of thorough examination reports for the following plant:
- 2.4.7 Records were sampled and found to be adequate. ME noted records generally covered the last 3 years as requested, however some of the latest examination records had not been provided. Given the records had not been completed at the time of the first CA document request, the outstanding records were subsequently requested by the CA and supplied (2021/84876).
- 2.4.8 ME noted that tanks and lids seemed to be interchangeable i.e. was examined. SFL confirmed that the lids were of the same design, however this was not verified by the CA. ME asked how the condition of the parent metal behind the lining was inspected as it was not explicitly stated in the records, in particular the fluorinated ethylene polymer (FEP) lining in CHF tanks and butyl lining within DHF tanks. SFL advised that the FEP liner is transparent and so damage, usually a stain derived from corrosion products, would be seen during the visual examination. SFL advised that for the butyl lining a damaged patch would be cut out thus exposing the parent metal beneath for inspection. ME was satisfied with this explanation.

2.5 **Training and Competence: Oxide Fuels and Tank Farm**

- 2.5.1 CA requested provision of training documentation for SFL staff involved in asset integrity activities across both **Sector 1** HF plant. The material supplied documented ongoing training and competence review activities and directly correlated to individuals undertaking EIMT and integrity assurance tasks.
- 2.5.2 To assess competency, CA sampled an SFL Role Proficiency Graph (RPG) for a Pressure Systems Inspection Group staff member. This document specified



roles and activities, for which the subject was deemed competent. CA noted the inclusion of work history, qualifications and annual review information. ME found the RPG to be non-intuitive regarding whether someone was 'proficient' and/or 'Able to Train'. However, it seemed to be an established and understood system at SFL. ME queried how proficiency is determined. SFL responded that it was for the Line Manager to determine, however consideration would also include feedback from wider staff. ME queried what checks are done before a staff member is assigned to work. SFL responded that the work supervisor refers to the RPG.

2.5.3 Further confidence in staff competence was gained during intervention Q&A sessions where staff were found to be open, honest and knowledgeable in their areas of responsibility. Similarly, during the plant walk-down, confidence was gained during discussions with operators and managers.

3 Plant Walk Down

3.1 Oxide Fuels Complex - External CHF Stock Tanks

- 3.1.1 The tanks and instrumentation were viewed and seemed to be in good condition (superficial corrosion was observed on some lid bolts) and in working order. ME asked what torque value the lid bolts were tightened to and was advised that the procedure **content of the seemed** only requires the bolts to be 'spanner tight'. This seemed reasonable given that this is a low-pressure system. A sample of designated safety Mechanisms was also inspected and found to be correctly labelled. Access to control rooms was discussed and it was decided that it would be easier to view instrument readings at the DHF control room. The transfer process was discussed –
- 3.1.2 The HF is transferred to the tank farm via pipeline, forced through by positive nitrogen pressure from **Sector**. ME asked what would happen should pressure be lost? SFL advised that the pipe-bridge is on a gradient so the HF would flow under gravity to the tanks. The tank bund was also viewed and seemed to be in good condition having just been re-painted. SFL advised that the volume of the bund was 125% that of the tanks. In addition, conductivity probes provide means to detect loss of containment through the appearance of product within the bund.
- 3.1.3 CA noted that a lifting block and tackle (used for the tank lids) had been left outside attached to the lifting beam and was exposed to the elements. ME queried this method of storage and SFL responded that the lifting equipment should be kept in the building when not being used and that they would rectify the situation.



- 3.1.4 CA highlighted that **Exercise** lifting beam utilised for lid removal should be marked with the safe working load and requested SFL provide LOLER¹ thorough examination documentation for the beam and associated block and tackle equipment. This information was promptly provided by email (2021/90535) and was considered by the CA to be satisfactory.
- 3.1.5 CA brought to the dutyholders attention a rip at the bottom of the HF splash curtain, which requires repair or replacement. CA explored arrangements for vessel preparation prior to internal inspection, specifically purging, flushing and testing to ensure the removal of residual material prior to manned entry. SFL operational staff were able to give confident and detailed overview of arrangements, exhibiting adequate understanding of the associated risks and control measures. CA was satisfied with the dutyholders response.
- 3.1.6 CA queried communication arrangements between **arrangements** operatives prior to and during the transfer of concentrated HF. The OFC Plant Manager described arrangements in place, which involve internal phone communication between the two units.
- 3.1.7 CA requested a copy of acid transfer operational procedure , subsequently supplied by email (2021/85427). CA was able to establish that communication arrangements and checks as described by the OFC Manager are formalised and included within the operating procedure. In addition, SFL confirmed that acid transfer has also been subject to human factors task analysis and provided the relevant COMAH safety report cross reference . The CA was satisfied that communication issues during acid transfer operations had been considered and adequate control measures applied.

3.2 Transfer Pipeline from OFC to the Tank Farm and Tanker Loading Bay

3.2.1 CA walked under the pipe-bridge for some of its length and noted that it seemed to be in good order. The HF pipe itself could not be seen as it is boxed off in a steel box section to protect the pipe from UV rays and mechanical damage. We were advised that the pipe is inspected routinely at the CHF end by the removed of the 'lid' from the boxing. It was suggested that varying the point of inspection would give more confidence that the pipe is generally in good condition. We inspected pipe-bridge anti-collision barriers and viewed signage, which warned of the safe height for vehicles going under the pipe-bridge (6.7m/ 22 feet). Barriers and signage seemed to be in good condition and adequate.

3.2.2 The engineering substantiation document for

covers the HF transfer pipeline from the tank farm to the tanker offloading bay. This document specifies a number of shortfalls identified by the dutyholder. Including, corroded supports, sagging

¹ Lifting Operations and Lifting Equipment Regulations 1998 (LOLER)



support trays, poorly installed polypropylene pipework. SFL had identified extensive work to rectify shortfalls.

3.2.3 From the tank farm, the CA clearly observed that the repair work is underway. Operators provided an overview of the extensive gantry renovation work and pipe replacement being undertaken. SFL highlighted the new HF pipework design, which involves a HF compatible polyethylene pipe within a secondary containment pipe, relocated to the outside of the pipe bridge in order to aid inspection.

3.3 HF Tank Farm

3.3.1 The DHF tanks, instrumentation and associated equipment were visually inspected and seemed to be in good working order. On inspecting labels CA did find that Safety Related lifting equipment had a very worn label that was mostly illegible. This was brought to the attention of SFL who resolved to replace the label. We also briefly visited the lifting equipment store mechanical Workshop) and found that equipment to be adequately labelled, inticket and properly stored.

3.4 **HF Tank Farm Control Room**

- 3.4.1 During the site inspection, the CA visited the tank farm control room and discussed process operations with SFL staff. CA noted staff were operating two computer-based process control systems, located side by side. The dutyholder explained the simultaneous use of two systems was due to a transfer from the old system to a newer version.
- 3.4.2 The CA established that whilst some operators had received a verbal briefing, there were no written instructions to assist operators during this transition. The CA confirmed the arrangements were considered inadequate, given the potential for a mistake or error during plant operation and monitoring activities.
- 3.4.3 The dutyholder was asked to take immediate corrective action to control risk during the control system transition processes. SFL provided a summary interim action taken, including photos to illustrate on screen warning banners that had been introduced (CM9 2021/85436). CA raised a Level 4 regulatory issue (RI-10483) to track the timely completion of the control system upgrade and a return to single process control display.
- 3.4.4 Through ongoing communication with the dutyholder and provision of supplementary documentation, the CA has confirmed completion of the operating system upgrade and the return to a single system (email 2021/90535 refers). The CA consider RI 10483 complete and the action has been closed.



4 Safety Report Submission

- 4.1 Every five years an upper tier COMAH Operator will submit their revised safety report to the CA for assessment. The process is laid out within the COMAH safety report assessment manual (<u>SRAM</u>). The CA confirmed current submission dates with the dutyholder and provided an overview of SR pre-receipt activities, that take place approximately a year before submission. The CA explained the purpose pre-receipt activities, specifically to understand relevant changes, review past performance, discuss the scope of the assessment and confirm practical arrangements, such as the sharing of official sensitive information.
- 4.2 The importance of highlighting key changes within the report was emphasised by the CA and relevant examples explored, for example:
 - Plant and/or process modification;
 - Changes to safety management systems;
 - Changes to staff numbers;
 - Change of hazardous substance inventory;
 - Change of substance classification under CLP²;
 - Increase or decrease in major accident risk profiles;
 - Changes to land use and population both on and off site;
 - Relevant changes to technology / standards; and
 - Operational experience, including learning from worldwide incidents and events.
- 4.3 The CA explained that under COMAH regulation 21, where it is considered expedient, the operator may submit parts of the required safety report information by reference to information contained within another document, for example a relevant nuclear safety case. SFL were informed that a written request would be necessary for such submissions and referred the dutyholder to the HSE Guidance publication, L111, The Control of Major Accident Hazards Regulations 2015.
- 4.4 SFL responded positively to the discussion and explained that the majority of SR preparation work would be undertaken during January to December 2022. The CA agreed to timetable a discussion in early 2022 to address SR submission and pre-receipt in greater depth.

5 Conclusion of the Intervention

5.1 CA sought assurance that HF tanks and pipes are fit for purpose and meet RGP; that the HF tanks and pipes undergo appropriate EIMT; and that relevant operators are SQEP. CA sampled from a large number of documents and took

² Retained CLP Regulation (EU) No. 1272/2008 as amended for Great Britain



further confidence from a plant walk-down and detailed discussions with key SFL personnel.

- 5.2 In conclusion, based on the samples undertaken, CA was satisfied that HF tanks and pipes are fit for purpose and meet RGP; that these items undergo appropriate EIMT and that staff are SQEP. In addition, CA was assured that HF pipeline shortfalls identified by SFL are being addressed.
- 5.3 CA offered the following advice during the intervention:
 - Tanks SFL should assure itself that older tanks, where design information may be scarce, are still fit for purpose and meet ALARP e.g. weld integrity. SFL should also consider monitoring tank low temperatures.
 - OFC tanks The rip at the bottom of the HF splash curtain, requires repair or alternatively replacement.
 - Lifting equipment SFL should ensure that lifting equipment is stored in accordance with their arrangements and lifting beams are marked with the safe working load.
 - Labelling SFL should ensure that worn labels are replaced before they become illegible.
 - Action management SFL should more closely manage actions to a timely conclusion where these actions offer improvements and strengthen ALARP justifications.
- 5.4 During the walk down, CA identified staff were operating two computer-based process control systems within the tank farm control room. CA considered this arrangement inadequate, given the potential for a mistake or error during plant operation and monitoring activities. The CA tracked SFL application of interim control measures and corrective action. CA is content this shortfall has now been resolved.
- 5.5 CA took the opportunity to provide the dutyholder with information regarding SR pre-receipt activities. SFL responded positively to the information received. CA agreed to timetable a discussion in early 2022 to address SR submission and pre-receipt in greater depth.
- 5.5.1 Overall the inspection was rated **Green No formal action**, although some elements were below the standard expected.



6 ISSUES

6.1 Issues Raised

No	Issue Title	Category	lssue Level	Licensee/Duty Holder Role	Owner (Inspector)	Completion / Review Date
RI-10483	Tank farm process control system – Confirm completion of upgrade and return to single SCADA display.		4	Springfields Fuels Limited		31 December 2021

6.2 **Issues Closed**

No	Issue Title	Category	lssue Level	Licensee/Duty Holder Role	Owner (Inspector)	Completion / Review Date
RI-10483	Tank farm process control system		4	Springfields Fuels Limited		14 December 2021

RECORD APPROVAL, SIGN-OFF AND ISSUE

RECORD APPROVAL AND SIGN-OFF

Revision	Name	Responsibility	Executive Summary Approved	Date
0A		NIHSS Inspector		22 December 2021
0		DFW Sites' SI		22 December 2021

VERSION CONTROL

Revision	Date	Description of Change
0A	22/12/2021	1 st draft
0	22/12/2021	1 st issue



CIRCULATION LIST

