Presentation to the Spent Fuel Management and Nuclear Materials Working Group of the West Cumbria Sites Stakeholder Group

Paul Brennan
Director of SFM
Recap: The NDA Mandates given to SFM

- Complete the reprocessing of all Magnox fuels (Magnox Operating Programme known as MOP)
  - Processing of First Generation Spent Fuels which have provided significant and diverse contribution to UK and International generation capacity. Receive and process other NDA material.

- Complete Thorp reprocessing contracts by 2018
  - Processing of Second Generation Fuels (Oxide fuels) - which have continued to provide significant contribution to UK and International generation capacity

- Interim safe store all remaining AGR lifetime fuel arisings
  - Receipt and interim storage of fuel from the current generation of UK oxide reactors. The planned lifetimes of many of these reactors are being extended

- Managed closure of the Sellafield MOX Plant
  - Plant rundown and Post Operational Clean Out of the first Sellafield MOX Plant

- Hazard reduction and ongoing storage of plutonium bearing materials
  - Treatment of reprocessing products and storage of UK plutonium

- Operate the Wet Inlet Facility
  - The receipt and storage of material from customer

- Vitrification of Highly Active Liquor (HAL), Vitrified Residue Returns (VRR) programme
  - Safe HAL storage in HALES, supporting reprocessing, feeding Waste Vitrification Plant
  - Return of HA VRR containers back to overseas customers
SFM: A reminder of the Plants and Processes

- EDF AGR Reactors (6)
- Wylfa
- Calder
- Transport to Sellafield
- Fuel Handling Plant
- Inlet Cells (3) flasks
- Conditioning and Treatment
- Waste Streams
- Magnox Reprocessing Plant
- Dismantle AGR fuel elements
- Waste Streams
- Thorp Reprocessing Plant
- Uranium and Plutonium Product Finishing and Storage
- Evaporation and Vitrification*
  *HLWP became part of SFM 15/04/2016
- SIXEP (Site Ion Exchange Plant)
- Conditioning and Treatment
- Uranium and Plutonium Product Finishing and Storage
- Waste Streams
SFM Headlines for 2018/19 Q3

• Magnox has revised the forecast to below the ‘Acceptable’ performance target of 450te. Following outage the resumption of reprocessing was held due to a failure of a cooling water line during restart.

• Vitrification plant has revised the forecast to ‘Good’ performance level of 858 teU. Currently in outage with planned return to service in early Jan 19. Line 2 impacted in P7 by failure of Decontamination Tank Spray Ring and subsequent recovery. Planned return to service in early January 2019. Line 1 is undergoing rebuild.

• Thorp shear completed on the 9th November 2018 achieving the ‘excellent’ target of 280te with the agreed campaigns.
Strategic Aim and Key Milestones

The managed closure of the fleet of UK Magnox Stations and the receipt and treatment of other NDA material.

Strategic Tolerance - End of Reprocessing December 2020

Impact of Performance on the Strategic Aim

Following delivery of the planned outage scope to schedule, the resumption of reprocessing has been held following a failure of a cooling water line during restart. The failure required a complete line replacement which has been completed and reprocessing commenced on 27/12/18 and means that decanning performance is further behind schedule and whilst the 450te is still achievable, it is no longer a credible forecast due to lost-time and the necessary focus on reprocessing legacy fuel and DFR. The revised forecast is therefore 360te for the year end. Fuel receipts remain on schedule to achieve delivery of 512te by the end of the year. Wylfa and Calder defuelling operations continue to maintain good performance and are not currently forecasting to impact end of reprocessing critical path. Dounreay Fast Reactor (DFR) deliveries have been held during the extended reprocessing outage and are due to resume in January 2019.

### Performance Q3 2018/19

<table>
<thead>
<tr>
<th>Units</th>
<th>YTD Target</th>
<th>YTD Actual</th>
<th>Variance</th>
<th>Full Year Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Decanning (te)</td>
<td>305.8</td>
<td>226.24 (incl. 12.29te corroded)</td>
<td>-79.56</td>
<td>450 (incl. 35 te corroded)</td>
</tr>
</tbody>
</table>

‘Good’ Performance
Ongoing Receipt of AGR Fuel as at December 2018

Strategic Aim and Key Milestones

Receipt and treatment or interim storage of fuel from EDF AGR stations. Station extensions have been introduced into the plan.

- Receipt of lifetime AGR arisings until 2038

Impact of Performance on the Strategic Aim

The plant is available for Fuel receipts and continues to meet customer demands and underpin the strategic aim of the AGR programme.

AGR receipts are slightly ahead of the planned scheduled 178te

Performance Q3 2018/19

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<tr>
<td>Fuel Receipts (teU)</td>
<td>133 (Baseline)</td>
<td>145 (Baseline)</td>
<td>+12 (Baseline)</td>
<td>178 (Baseline)</td>
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Strategic Aim and Key Milestones

Reprocessing of UK and Overseas Oxide Fuel

- End of shearing November 2018
Reprocessing schedule has been realigned to reprocess high risk fuel to programme area 11 as priority

Impact of Performance on the Strategic Aim

Shearing completed. Shear cave debris recovery has now been completed. Chemical Plants outage underway with a planned restart at the end of January through to June 2019 for rundown completion.

Performance Q3 2018/19

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</thead>
<tbody>
<tr>
<td>Fuel Sheared (te)</td>
<td>250</td>
<td>280</td>
<td>+30</td>
<td>250 “Excellent” Performance</td>
</tr>
</tbody>
</table>
Vitrification Plant as at December 2018

### Strategic Aim and Key Milestones

**HAL Vitrification**
- End of bulk HAL Vitrification March 2022
- This is now impacted by throughput performance and the opportunity to introduce a revised POCO blending strategy.
- HALES/HLWP Support to Reprocessing

### Impact of Performance on the Strategic Aim

Forecast revised to the ‘Good’ performance target of 858 teU. Line 3 has operated in excess of planned throughput and went into Outage during period 7. Planned return to service in early January 2019. Line 2 impacted in period 7 by failure of decontamination tank spray ring and subsequent recovery. This has introduced an extended period of downtime. Planned return to service in early January 2019. Line 1 is currently undergoing rebuild.

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<tbody>
<tr>
<td>Total Hazard Reduction (teU)</td>
<td>701</td>
<td>525</td>
<td>-176</td>
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</table>

Full Year Target: 858 “Good” Performance
**Safe Storage of Plutonium as at December 2018**

### Strategic Aim and Key Milestones

**Treatment of reprocessing products and storage of UK plutonium**
- Stores created to support National Consolidation
- Retreatment facility (SRP) forecast to be available 2025
- SPRS extensions forecast to be available 2030 and 2037

### Impact of Performance on the Strategic Aim

- Facilities continue to support delivery of the key strategic aims and milestones.
- Project enabling works progressing well in support of National Consolidation priorities. Shipments will now continue into next FY.

### Performance Q3 18/19

- Finishing Lines have continued to support Magnox & Thorp demands, with sufficient storage space in place.
- Sellafield Product and Residue Store (SPRS) imports target for 2018/2019 reduced in line with strategy to preserve SPRS space and enable SRP project interaction works.
- Successfully supporting ongoing National Consolidation Programme. However, due to packaging delays at Dounreay, receipts completion will now be within FY19/20. Transfers will continue during FY18/19 pending ONR licensing.
- The SRP Outline Business Case has gained HMG approval and NDA have released funding to allow the project to complete detail design.
- SL now also received formal planning permission for the construction of SRP. The facility will take historic nuclear material, currently stored at various locations across the site, retreat and repackage the material, before transfer to the Sellafield Product Residue Store (SPRS) for long-term storage. Delivering SRP is of immense importance and brings enduring risk reduction benefits to our workforce, the environment and the local community.
- First Generation Finishing Line (FGFL) – Good progress continues to be made in repairs to the facility infrastructure through the Asset Envelope, Electrical Distribution System, and Pipe bridge projects in conjunction with the risk reduction activities including asbestos removal and containment barrier installations.
- SL appeared in Carlisle Crown Court on 11th December for the Pre Trial Review hearing. This is a routine part of the legal process where administrative matters are dealt with by the Court, allowing any subsequent trial to proceed efficiently. No plea was entered and the case is continuing.
Wet Inlet Facility as at December 2018

Strategic Aim and Key Milestones

The receipt and storage of material from customer

- Maintain and store received fuels to ~2042
- Complete transfer of fuel from old pond to new pond by 2027

Impact of Performance on the Strategic Aim

Flask move completed in Period 8

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<th>Variance</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Equivalent Flask Moves</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
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