



# Sellafield Ltd

**A Nuclear Management Partners company  
operated under contract to the NDA**

# Supply Chain Quality

*CQI NucSIG / Nuclear Institute Event  
26 March 14*

Gordon McNeil/Neil Ivison

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# Background – Commercial Data

- SL expenditure 13 /14, £933 Million, ASFL £1.72 Billion  
14 /15, £1071Million, ASFL £1.8 Billion
- 6100 suppliers in the SL vendor database with 1000 active in 13/14
- 50 - 60 tier 2 suppliers ( quality grade 1 & 2 )
- Major Projects Supply Chain forecast expenditure over next 5 years is circa 6 Billion.
- Cost of quality failure is estimated at > £30 Million / year

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# Aim

Improving our connectivity and performance of the Supply Chain.

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# Supply Chain Quality

## Vision

**Demonstrable Improvement in SL's Supply Chain Capability**

## Mission

Implement SL Qualification Programme to Agreed List of Tier 2 Suppliers. ( Proactive )

Aligned Responsibility & Accountability Being Used for Supply Chain Quality

Evolve a Quality Intervention Capability for the Supply Chain ( Reactive )

## Objectives

Establish Qualification Programme by Oct 14

Completed Qualification Process with 5 off Tier 2 Suppliers by March 2015.

Enhance Commercial Arrangements and Engineering Standards to Reflect Supply Chain Qualification Programme ( Plan by June 14 )

Lead Measurement System In Place by Aug 2014.

Define Align All Interfaces & Accountabilities for Activities affecting Supply Chain Quality by July 2014

Define & put in place a coaching programme to grow intervention skill Dec 14

Establish an intervention process by Oct 2014

### Qualification

### Measurement

### Intervention

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# Operating Principles

- Deploy a Supply Chain qualification system and expand potentially to other SLCs. (enhanced industry supply chain & shared costs)
- SL to provide necessary coaching and training to raise standards
- Develop improved behavioural engagement approach to enable Supply Chain to innovate
- Supply Chain initial self assessment.
- Selection process based around risk, value and medium / long term involvement
- Single engagement programme in conjunction with the Supply Chain. (consolidating and stopping 5 existing approaches)
- Single, integrated approach aligned with support areas i.e. Commercial and EHSQ.

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# Qualification Framework

Programme

Process

System

People

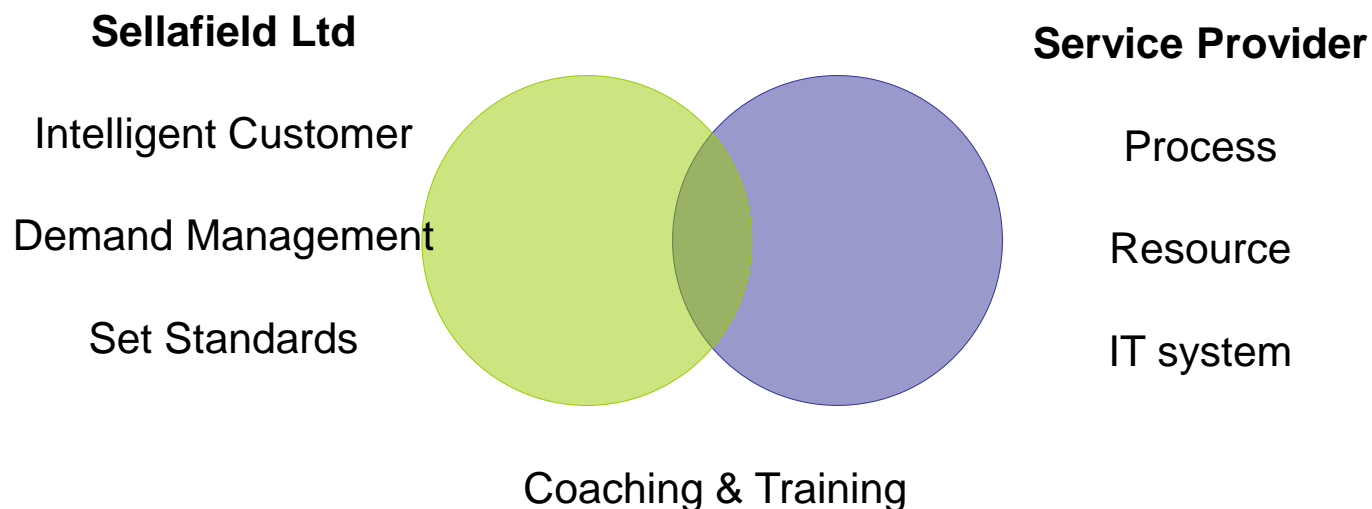
Skyline Assessment						
<p>It is unclear to identify process improvements to the distribution, review, approval and submission of Quality Plan and Inspection and Test documents.</p>	<p>Comprehensive Quality Plans are prepared, Supply Chain Model is submitted to the Customer format and Test Plans are submitted within the specified timescales.</p>	<p>To level Subcontract Quality Plans are produced appropriate to the size and complexity of the work scope. Sub Contract Quality Plans are closed out in line with completion of work.</p>	<p>All process critical steps and specialist processes are identified clearly and unambiguously.</p>	<p>Quality Plans submitted for review and approval are identified in line with requirements. Hot points are identified, and the Customer is notified of verification points in the with increased time schedules.</p>	<p>All required information is available, with sufficient detail, presented in a logical sequence. Wording is clear &amp; unambiguous. Lifetime records are identified, reviewed, approved and acceptance in accordance with the specification and contract requirements to monitor work the plans will facilitate the opening of all activities against the agreed Inspection Activity Codes.</p>	<p>Closed out Quality Plans are reviewed for their ease of use and effectiveness of application, IFE is communicated and used to update master documents/ inform new Quality Plans.</p>
<p>Quality plan to read Inspection and Test Plans have not been submitted to the customer for acceptance within 1 working day (or as agreed) of receipt of the contract.</p>	<p>Quality Plan and a Supply Chain Model (Customer format) or equivalent have been prepared but some elements of the information is incomplete/ insufficient.</p>	<p>Sub contract and a top level Quality Plan have been produced which reference each individual Sub Contract Quality Plan, but are not consistent with the scope of work.</p>	<p>A number of process critical steps and/or specialist processes are missing from the Quality Plans.</p>	<p>The Contractor does not have a clear understanding of all the hot points in the Supply Chain, leading to insufficient in the Customer potentially impacting agreed approval processes.</p>	<p>All required information is available, with sufficient detail presented in a logical sequence. Wording is clear &amp; unambiguous. Lifetime records are identified, however there are gaps in the review, approval and acceptance of records in accordance with the specification and contract requirements.</p>	<p>The level of information contained in each of the components does not contain sufficient detail.</p>
<p>Expectations of requirements are known but there is no agreed deviation for the review &amp; approval of the Quality Inspection and Test plans.</p>	<p>Separate quality plans exist for the separate phases of work but a Supply Chain Model (SCM) 1, 10, 3, 10, 10 flow has not been completed or submitted.</p>	<p>Quality plans exist covering all elements of the work scope, but there is no top level Quality plan to show the flow between the work.</p>	<p>A number of process critical steps and/or specialist processes are missing from the Quality Plans.</p>	<p>Hot points are seen as optional verification points by the Contractor, that the Contractor can choose to proceed past at their own risk.</p>	<p>All required information is contained within the document(s), but the level of detail the work is precise does to be insufficiently detailed or presented in an logical sequence, making the documents difficult to follow. Wording leading to the input of the activities is unclear/ambiguous.</p>	<p>One of the main parts is missing a number of its components.</p>
<p>Expectations of requirements are not known by appropriate personnel.</p>	<p>Quality Plans do not cover the separate phases of work in sufficient detail.</p>	<p>Quality plans do not consider the complexity of the work scope being covered, and are not sufficient to ensure that all required elements are identified.</p>	<p>The Contractor does not understand why the identification of process critical steps or specialist processes is important to the preparation of Quality Plans.</p>	<p>The Contractor has not clearly communicated the significance or impact upon work of Quality Plans awaiting approval.</p>	<p>There is a gap in the information contained in any of the following areas: identifying reproducible processes, identifying management accountability for delivery of the customer requirements for lifetime records.</p>	<p>One or three of the three main parts are missing a number of their component elements.</p>
<p>The distribution for review &amp; approval of the Quality Plan/Inspection and Test Plans shall be agreed at the start (kick off meeting) and they shall be submitted to the Customer for acceptance within 1 working day of receipt of the contract (Clause 5.1, 5.2)</p>	<p>Quality Plans and Inspection and Test Plans shall be in place for the start (kick off meeting) and they shall be submitted to the Customer for acceptance within 1 working day of receipt of the contract (Clause 5.1, 5.2)</p>	<p>The size and complexity of the work scope is considered when preparing the Quality Plans, and Inspection and Test Plans where appropriate more than one Quality Plan consisting of a top level Quality Plan for the identified scope which references each individual sub quality and Inspection and Test plan (Clause 5.2)</p>	<p>The Contractor shall ensure that all process critical steps and specialist processes are identified. Specialist processes include but are not limited to welding, pipe work bending, heat treatment, non destructive testing, material fitness and concrete mix design. These will require approval by the Customer (Clause) 5.4, 5.9</p>	<p>The Contractor shall not commence work until the Quality Plan prior to acceptance by the customer. Any hot points identified in the Quality Plan must not be exceeded without Customer verification/acceptance (Clause) 5.4, 5.8</p>	<p>Quality Plans shall conform to the customer scheme as defined in CDRs (Clause 5.10.1 - 5.10.4)</p>	<p>Quality Plans and Inspection and Test Plans shall consist of 3 main parts, each part will consist of component drawings as defined in the CDRs (Clause 5.10.5-5.10.8)</p>
<p>Level of Maturity 1 2 3 4 5</p>						
5 Quality Plans						

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# Qualification Approach

*Leading to an improved Supply Chain capability*



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# Qualification Deployment

- **Assessments to be undertaken against the defined criteria to demonstrate levels of maturity of our requirements applicable to the scope of supply**
- **Circa 50-60 Tier 2 assessments over the next 5 years, commencing October 2014**
- **5 - 8 organisations to be assessed this financial year**
- **Tier 2 suppliers will deploy this approach to their supply chain, therefore further opportunities to deploy the process exist – Sellafield Ltd predict typically 250 T3/T4 suppliers over the next 5 years**
- **A surveillance periodicity will need to be defined**
- **An initial self assessment process to be verified by the third party**
- **Sellafield Ltd need to understand any potential service providers speed of deployment**

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# Qualification Resource

- **Capable and flexible resource able to deliver the assessments at any location predominantly in the UK and Europe within a timescale to be defined**
- **Suitably Qualified and Experienced Personnel who are competent in assessing organisations to meet Nuclear requirements**
- **Support in the development and deployment of coaching & training**

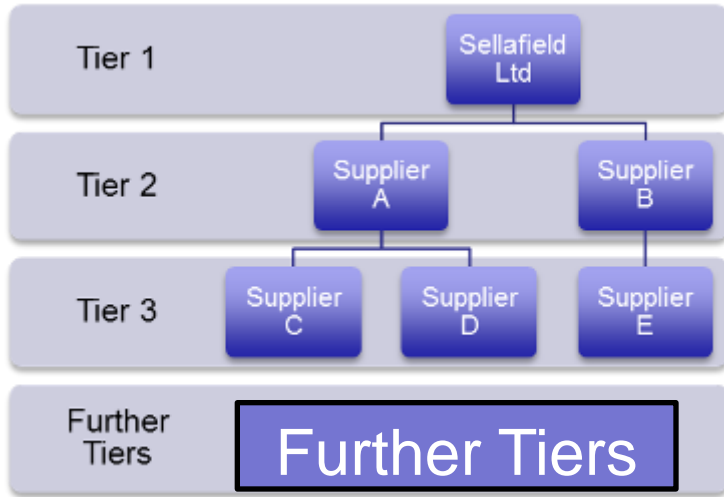
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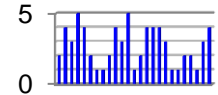
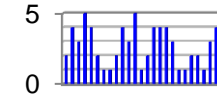
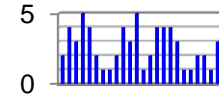
# Qualification IT System

## Report and KPIs

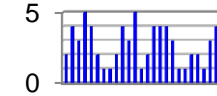
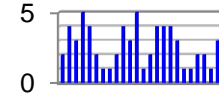
### Supply Chain Mapping



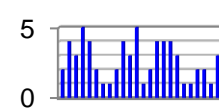
Supplier A



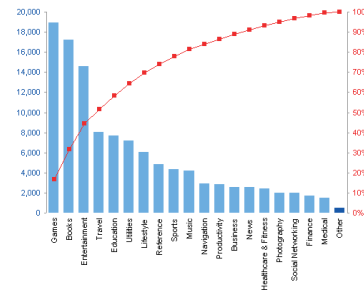
Supplier B



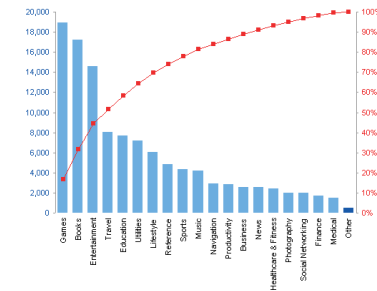
Supplier C



Analysis by theme



Analysis by Supplier



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# Summary

- Supply Chain performance improvement is essential to deliver SLs Customers obligations.
- SL are implementing supporting processes and practices
  - Pro - active - Qualification Programme
  - Re - active - Intervention Process
- 
- Support from SL & our Supply Chain is a “ must ” to maximise the opportunity.

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# Evaporator Delta Learning From Experience Brief

*Neil Ivison Head of SL Quality*

Date: March 2014

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# Background – Why is EVAP D required?

The Evaporator Delta project supports key processes which underpin the Sellafield Limited's operations:

- Concentration of liquors from Thorp reprocessing which completes the overseas reprocessing contracts and supports ongoing receipt of UK fuel.
- Continued reprocessing of effluents from vitrification plants which in turn support high hazard reduction by vitrifying highly active liquors.
- Concentration of liquors from Magnox reprocessing which in turn supports the Magnox Operating Plan.

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# Background – Major Elements of Construction

## Major Procurements





# Background – Major Elements of Construction

## Module Delivery and Installation



# 5 Key areas of learning

Common themes for learning from reviews of the project:

1. Commercial management.
2. Contractor assessment and selection.
3. Design and engineering.
4. Project management and governance.
5. Supplier delivery and quality issues.

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# Commercial management: key learning

## Influences

- The strategic need for additional evaporator capacity led to a contract that was heavily incentivised for schedule delivery.
- Decision making was focussed on delivery to a challenging schedule which increased cost and resulted in a high number of quality related events.
- Seismic sub-contractor took a very conservative approach to the design in an attempt to mitigate design risk.

## Key Learning

- The contract has to drive the right behaviours.
- Key sub-contract drivers and incentives should also be aligned.
- It is essential that Projects develop contingency arrangements to mitigate poor contractor performance on critical path items.

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# Contractor assessment and selection: key learning

## Influences

- At the procurement phase there was a strong company driver to broaden Sellafield Ltd's supplier base.
- Main contractor selected had limited recent nuclear experience at Sellafield (Their nuclear experienced partner pulled out at an early stage).
- The risk of utilising an immature supply chain was not recognised early enough in the project.

## Key Learning

- Rigorous supplier qualification, with minimum qualifications for bidding companies should be a basic requirement.
- More emphasis is required to demonstrate current relevant capability and experience.
- Failure of technical capability and quality assessment should lead to supplier rejection.
- Sellafield Ltd need to have direct influence on critical sub-contractor and supplier selection, including tier 3 supplier certification.

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# Design and engineering: key learning

## Influences

- Programme and commercial considerations led to over conservative seismic model and pipe stress analysis.
- Incomplete design and multiple iterations resulted in delays and cost increases in “downstream” procurement and construction.
- Seismic and piping standards were unclear/ambiguous.
- Changes to specifications after contract award

## Key Learning

- Design growth and complexity and or construction and fabrication changes should be fully assessed and appropriately managed through the change control process and EVMS (Earned Value Management System).
- Clear lines of accountability and authority for the design intelligent customer should be defined.
- Changes in design need to be reflected in the project programme.
- It is essential that there is an established document management process for control of “approved for construction” design packages and the tracking of technical queries.
- Wherever possible ensure specification changes are avoided after contract award to preclude quality cost and schedule impact

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# Project management and governance: key learning

## Influences

- The appropriate quality, assurance and oversight arrangements to assess the main contractors implementation of appropriate quality arrangements were not fully implemented.
- The main contractor did not operate the appropriate assurance and oversight arrangements to assess the supply chain's implementation of appropriate quality arrangements.
- Closer relationship required with key sub-contractors.

## Key Learning

- Ensure there is clarity around organisational roles and responsibilities.
- Ensure learning and recommendations from previous reviews and wider LFE is fully embedded.
- Ensure the established governance structure is able to make appropriate and robust challenges and guide the project as required.
- Ensure that governance and reporting mechanisms raising adverse trends that will affect cost and schedule are recognised and sentenced in a timely manner to limit their impact.
- Partner with key suppliers able to meet Sellafield Ltd's requirements.

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# Supplier delivery and quality issues: key learning.

## Influences

- Significant quality issues were encountered with the supply of standard procurement items, e.g. commercial grade pipe and fittings.
- Project opted for quickest and cheapest route for commercial grade pipe and fittings.
- Significant issues with Nitric Acid Grade pipe and plate, our order was 4% of the order book, our testing requirements are twice as rigid as any other customer.
- 17 years since our last major purchase.
- Multiple design changes, but no flexibility on the delivery dates.
- Project was very much delivery focussed.

## Key Learning

- Clearly specify our requirements and expectations.
- Check capability and current standards via samples of products.
- Ensure suppliers understand the application of the product, underpin visits with Nuclear Safety and Specification Awareness briefs.
- Check understanding, face to face.
- Support suppliers who lack nuclear experience.
- Assurance, Oversight and Inspection must be tailored to mitigate risks to nuclear safety (e.g. vessel manufacture) and operational performance requirements.
- Use single point accountability to liaise with the supply chain.
- Use material control database to control and track all materials.

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# Summary

**Any questions??**

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