



<b>Operations Directorate</b>	Reference:	NDA/038/TBuRD/TMS
	Issue:	Issue 1
	Date:	March 2011

## RSRL TECHNICAL MANAGEMENT SUMMARY

### SUMMARY

This Technical Management Summary provides details of RSRL's technical governance and assurance arrangements along with highlighting accountabilities, roles and responsibilities. It also provides information on RSRL's gated approach to sanctioning of work activities and on the system used for assessing technology maturing using Technology Readiness Levels (TRLs).

This document should be read in conjunction with:

- Process Wiring Diagrams – This highlights planned technologies and their current maturity
- Research and Development table – This describes how RSRL plans to resolve technical issues underpinning delivery of the Life Time Plan (LTP).
- Annual Technical Report – This details any changes in governance and assurance processes and any significant in-year changes to the baseline and R&D requirements.

These four documents encompass RSRL's Technical Baseline and Underpinning Research and Development (TBuRD) requirements as required in NDA Doc No. EGG10 Rev 3 (Feb 2011).

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\* This sign-off encompasses the Technical Management Summary, Process Wiring Diagrams and Research & Development table. The Annual Technical Report will be submitted and approved separately.

**Document History**

<b>Version</b>	<b>Date</b>	<b>History</b>
Draft 1	1 March 2011	Distributed for comment
Issue 1 (LTP Baseline March 2011)	10 March 2011	Amended following comments received from RSRL directors and RWSG members.

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## 1 INTRODUCTION

This Technical Management Summary provides details of RSRL's technical governance and assurance arrangements along with highlighting accountabilities, roles and responsibilities. It also provides information on RSRL's gated approach to sanctioning of work activities and on the system used for assessing technology maturing using Technology Readiness Levels (TRLs).

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These four documents constitute RSRL's Technical Baseline and Underpinning Research and Development (TBUrd) requirements as needed in NDA Doc No. EGG10 Rev 3 (February 2011).

The RSRL TBUrd is intended to provide transparency of the technologies that underpin the operation and/or decommissioning of individual facilities or groups of facilities and demonstrate that appropriate R&D activities have been identified and are being progressed.

### 1.1 Research Sites Restoration Ltd Overview

The Harwell and Winfrith sites are two former UK Atomic Energy Authority (UKAEA) nuclear research sites which have been undergoing decommissioning and restoration since the early 1990s. UKAEA continued to manage the decommissioning, on behalf of the Nuclear Decommissioning Authority (NDA) from its formation in April 2005, but has now been restructured to allow the NDA to compete the management of these sites in the future. RSRL was formed to manage the newly combined Harwell and Winfrith sites for the NDA and commenced operations on 2<sup>nd</sup> February 2009.

RSRL is currently operating as a separate wholly owned subsidiary of UKAEA Ltd (who are owned by Babcock International Group), with its own employees, assets and liabilities. RSRL holds the nuclear site licences, discharge authorisations and other regulatory approvals necessary to operate the Harwell and Winfrith sites. The contract from the NDA for the management and operation of the sites is with RSRL who in turn have a parent body agreement with UKAEA Ltd. The NDA also has a parent body agreement with UKAEA Ltd pending competition for the ownership of RSRL.

The work described in the LTP to deliver the RSRL programme and achieve the site end-points for Harwell and Winfrith is covered by key phases, as follows:

- Care and maintenance (Winfrith only)
- Interim end state (Harwell and Winfrith)
- Site closure (Harwell and Winfrith)

The plan is to:

- Make radioactive waste passively safe and/or transfer it off each site
- Make redundant facilities safe for a period of care and maintenance
- Decommission redundant nuclear facilities
- Remediate contaminated land and groundwater
- Demolish redundant buildings
- De-license each site

## 2 TECHNICAL GOVERNANCE AND ASSURANCE

Policy POL0025 is RSRL's corporate governance statement and outlines the main powers and objectives of RSRL and the corporate governance structures that must be in place to ensure that these are attainable. The policy sets out the:

- Powers and Objectives
- Regularity and Propriety
- Board of Directors
- Audit Committee
- Remuneration Committee
- Management System
- Review of Governance Arrangements

### 2.1 Overview of the RSRL Management System

The RSRL Management System is designed to support the various processes undertaken on its sites. Following a review against business needs and best practice RSRL's management system is currently being updated through the Management System Improvement Project. This project is due to be completed by the end of March 2011. The RSRL Management System is available through the RSRL Intranet.

The overall structure of RSRL's processes is described in the Management System Manual MAN0001.

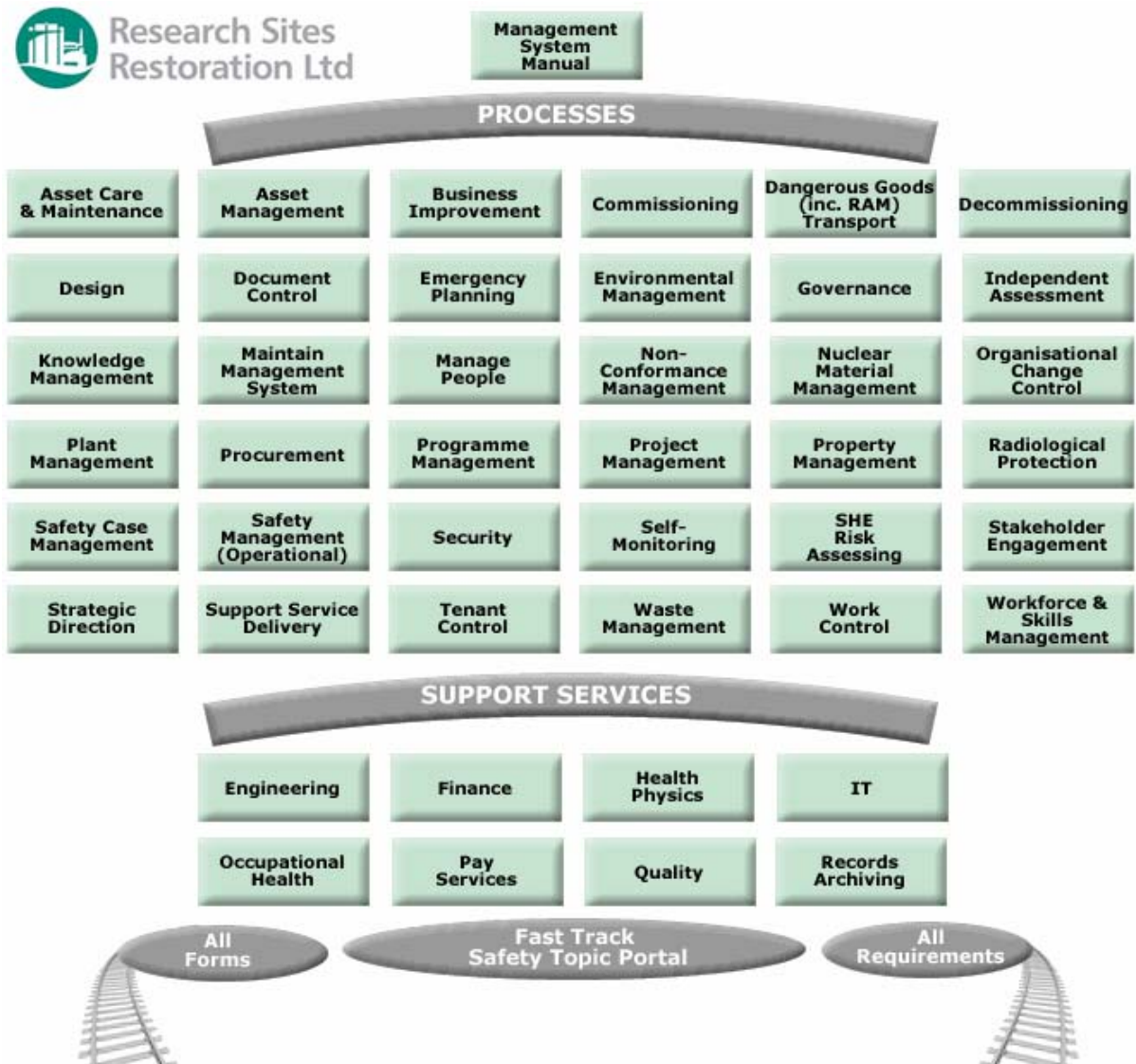
The three different types of process are:

- **Strategic processes** – including, for example, governance, independent assessment and strategic direction.
- **Delivery processes** – including, for example, design, decommissioning, programme, management and project management
- **Supporting processes** – including, for example, asset management, environmental management and knowledge management.

RSRL ensures continual improvement in its Safety, Health, Environmental and Quality Management by establishing and monitoring annual objectives and targets. The overall site performance is measured through a programme of integrated monitoring and assurance activities.

The RSRL management system portal (Figure 1) is designed to provide easy access to each process along with links to forms, requirements and a 'fast track' safety topic portal.

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**Figure 1: RSRL Management System**

## 2.2 RSRL Assurance Arrangements

The RSRL Board and the Executive Committee require assurance that company undertakings are being conducted in a manner that is compliant with legal, contractual and other key obligations and the RSRL Management System. This is mainly achieved through the assurance activities identified in MAN0034. Assurance can be viewed as the activities within the management system that;

- Give management confidence that the management system is:
  - compliant with external and internal obligation;
  - functioning correctly; and
  - is effectively implemented
- Prompt management to take action so that:
  - identified problems are addresses;
  - the management system develops appropriately so it continues to meet the organisations requirements

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The accountabilities, roles and responsibilities for RSRL Assurance Activities are summarised in Figure 2.

Role	Responsibilities	Accountable to
RSRL Board	Licence compliance. Review of performance against strategy, objectives, business plans and budgets	NDA Health & Safety Executive
RSRL Executive Committee	Performance monitoring. Identification of poor performance and examples of good practice.	RSRL Board
RSRL Directors	Delivery of performance ensuring compliance with RSRL standards and other requirements.	RSRL Managing Director
QAMS Manager	Identify and establish processes required to meet business needs.	RSRL Executive Committee
SSHE Assurance Manager	Independent inspection and monitoring of Safety, Security, Health and Environment arrangements.	Director of Safety and Environment*
Engineering Assurance Manager	Conformance of engineering and design activities.	Closure Director through the Technical Support Manager*
Waste Compliance Manager	Management of waste in accordance with legal and regulatory requirements.	Operations Director
Nuclear Materials and Radioactive Transport Manager	Control of dangerous goods and nuclear materials including independent compliance assessments.	Technical Support Manager and Closure Director
Programme Manager	Ensuring NDA deliverables under the M&O contract are fit for purpose. Carry out Programme Management Assurance Reviews	Programme Director

\* Also has a direct line of accountability to the RSRL Managing Director and chairman of the RSRL Board if there is concern that advice is not being taken at Director level.

**Figure 1: RSRL Assurance Roles, Responsibilities and Accountabilities**

Independent audits on compliance with RSRL procedures are carried out in accordance with the RSRL Assessment Process Manual MAN 0009 to ensure the effectiveness of the programme management process, its elements and procedures.

### 3 SANCTION AND VALIDATION

The RSRL Sanction Board commission, on their behalf, independent Gate Review teams (selected from a pool of competent and experienced persons) to carry out detailed reviews of the key aspects of individual work activities, i.e. programmes, projects, subcontracts and other procurements. The findings of the reviews are reported back to the RSRL Sanction Board.

Procedure PRC0020 sets out RSRL's 'sanction and validation' arrangements to comply with the Governance Policy POL 0025 and delivery of NDA requirements stated in PCP17.

The procedure covers:

- Approval by RSRL, NDA or DECC for Work Activities, depending on levels of expenditure.
- A gated process designed to validate the capability of Work Activities to satisfy business needs at each stage, to ensure that risk is reduced and the work is structured to deliver and is well communicated to all interested parties
- Monitoring and reporting programme, project, subcontracts and other procurements progress against the 'sanction' (approval) values.

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In order to achieve this RSRL has an internal review process consisting of the following gates:

- Gate 0 – Programme Strategy
- Gate 1 – Work Activity (Project) Justification
- Gate 2 – Delivery and Procurement Strategy
- Gate 3 – Investment Decision
- Gate 4 – Readiness for Service
- Gate 5 – Benefit Evaluation

Each internal gate consists of an independent and detailed 'Gate Review' followed by reviews by the RSRL Sanction Board and Executive Committee.

The reviews primarily focus on the business case and subcontract strategies associated with a Work Activity. A business case, which inherently needs to address technology readiness, is developed by the relevant project team then reviewed as it goes through the necessary 'gates'. The 'sanction' permits the Work Activity to proceed and the necessary expenditure to be incurred up to the next gate.

The Terms of Reference for the RSRL Sanction Board include, amongst other things, the need to ensure that programmes, projects and standalone procurements:

- Develop the technology needed and have R&D proposals that deliver the required technology.
- Include R&D and improvements to Technology Readiness Levels in the business case.

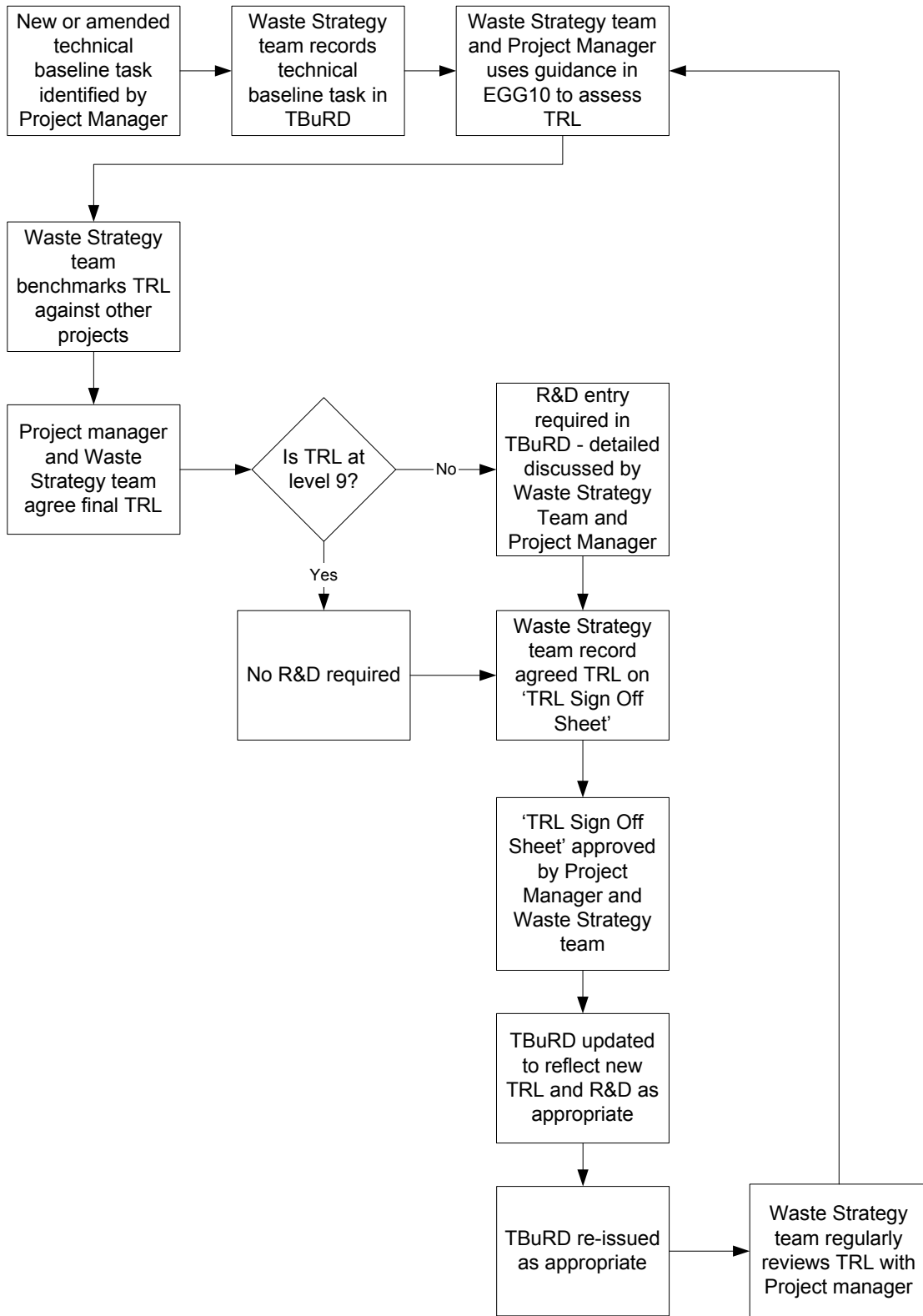
#### 4 ASSESSMENT OF TECHNOLOGY MATURITY USING TRL'S

In order to ensure the LTP is robust and underpinned, RSRL has identified areas where research and development (mainly development) is required. If a task has an R&D requirement this is assigned a Technology Readiness Level (TRL) in order to provide an indication of the readiness of the technology which will be applied. In the case of RSRL much of the R&D work is methodology development (as opposed to new technology) and therefore the TRL will be an indication of how advanced, for example, option studies or trials are. TRLs range from 1 (lowest) to 9 (highest) and are used to monitor progress across the LTP.

The Technology Readiness Level Guidance provided in Appendix 2 of NDA Doc No. EGG10 Rev 3 (February 2011) is used as the criteria by which RSRL assigns TRLs to tasks across the programme.

A TRL is assigned for each technical baseline task. The TRL is assessed by the project manager and then reviewed and benchmarked by the Waste Strategy section against other TRLs. Once the TRL has been agreed between the Waste Strategy section and the project manager a list of the TRLs assigned to each task is signed to record the agreement. The Waste Strategy section regularly reviews TRLs with the project manager. The process for ensuring standardisation of TRLs is given in Figure 3. Changes to TRLs from the previous year's submission of the TBuRD are detailed in the RSRL Annual Technical Report issued at the end of April each year.

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**Figure 3: Process for review and update of Technology Readiness Levels**

## 5 ADDITIONAL PROCESSES SUPPORTING THE MANAGEMENT OF R&D

### 5.1 Risk Management

RSRL's risk management is described in procedure PRC0087 and is carried out in accordance with the NDA's Doc No. PCP-10 Rev 1 (June 2006) – Baseline Management System - Risk Management.

Risks are identified by means of a top down (strategic) review and bottom up (project) review to capture events which may impact positively or negatively on the outcome of objectives. An exception process (known as the Group 1 / Group 2 Exception Process) is used to identify those risks which are within the defined contract scope and are the responsibility of the Site Licensee Company to manage, and those outside of the contract scope. The risks are assessed using the NDA Combined Probability Impact Diagram and managed by identification of risk owner and mitigating actions. Appropriate contingency is generated by modelling discrete risks through Pertmaster which is third party risk modelling software.

Any risk (threat or opportunity) identified within RSRL is entered into the RSRL Risk Management Database. Project risks are regularly reviewed and updated by the project team and the RSRL Risk Facilitator. Key risks (based on their residual assessment) are taken from the Risk Management Database and used to compile the RSRL Site Risk Register. This is reviewed by the RSRL executive team on a fortnightly basis.

Where a R&D need is identified in TBUrD the corresponding risk or opportunity from the Risk Database is cross-referenced on the TBUrD R&D table and Process Diagrams. TBUrD R&D references are also referred to as part of the mitigation for some risks. It should be noted that as the Risk Database is a dynamic system the risks identified in TBUrD are a "snap shot in time" only. Some R&D requirements are driven by issues that are fact, such as LoC submissions, rather than risk. Therefore not all R&D activities are accompanied by an associated risk.

### 5.2 Knowledge Management

In accordance with RSRL's Knowledge Management policy (POL0022) the Knowledge Manual (MAN4503) describes the processes required to ensure that knowledge is preserved over long periods of time. The knowledge management process recognises and accounts for the need to preserve the existing operational body of knowledge for the lifetime of the site which may extend through more than one generation of workers. The goal is to maintain a qualified workforce and supporting data base of knowledge that will enable the site to be safely operated and decommissioned.

There are a number of elements contributing to knowledge management at RSRL which are listed below:

- **The Management System.** Knowledge management and continuous improvement activities are embedded within RSRL processes and are embodied in Management Manuals, Standards, Codes of Practice and Procedures. These are supplemented by Handbooks (e.g. the Safety Assessment Handbook), guidance documents and support tools, which are made available through the Intranet system.
- **Documented knowledge.** This includes:
  - Documentation including safety cases/environmental support files, sanction papers/gateway reviews, project files, including Post Decommissioning Reports
  - Life Time Plans including scope, schedule and cost, and supporting documents such as the Integrated Waste Strategy.

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- Databases e.g:
  - IMAGES (GIS system),
  - Mainsaver (maintenance),
  - ATOM for nuclear materials holdings,
  - Waste databases,
  - NII Quinquennial Review Routemap,
  - Lessons Learned,
  - Meetings shared area (e.g. RSRL Waste Strategy Group).

Increasingly much of the documentation is being collected in the Electronic Document Management System (EDMS).

- **Knowledge transfer.** A number of formal mechanisms exist for knowledge transfer including meetings, publications and on-line (intranet and website) publications. Examples include:
  - Knowledge transfer networks and special interest groups such as the cross-site GIS users group
  - Computer based systems such as the Lessons Learned database and the distribution of electronic information such as Safety, Health and Environment Alerts.
  - Library resources and publicly available material such as the Barbour Index.
- **Knowledge management activities to support parked projects.** These include post project reviews and archiving of information for deferred decommissioning projects. Technical exit interviews are carried out so that there is some record of information that might be lost through loss of staff due to current funding constraints.

### 5.3 Management of Opportunities

RSRL procedure PRC0136 describes the process used to ensure opportunities are captured, evaluated, developed and implemented, in support of establishing a cost-effective Lifetime Plan in accordance with NDA requirements stated in PCP 16: Opportunity Management and PCP 17: Sanction and Validation. Technological opportunities are also recorded on the RSRL TBUrD R&D table and Process Diagrams as required by NDA Document No. EGG-10 Rev 3 (February 2011).

RSRL continues to operate the SAVE (Suggest A Value Efficiency) scheme to encourage staff at all levels to make suggestions on how to improve the efficiency of the organisation.

It is envisaged that the scheme will help to:

- Eliminate inefficiencies, waste or duplications
- Mitigate or avoid a future risk or expense
- Save money, resources and or time
- Streamline administrative procedures and operating methods
- Generate new income to RSRL
- Achieve additional value with minimal additional expense.

### 5.4 Management of Skills

RSRL's Workforce and Skills Management Manual (MAN0015) describes the process used to determine the skills and resources required to fulfil the programme of work. Workforce planning is carried out to ensure that the programme demands are met by a competent and efficient workforce. RSRL produces a Resource Skills Change Summary for each LTP submission and maintains a skills strategy which, as a minimum, covers: key skills required

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in the short, medium, and long term; identification of skills gaps and links to the migration of the existing workforce; sensitivities relating to demographic change; recruitment and training strategies; links with training providers; succession planning; and supply chain strategies for long-term availability of skills.

### 5.5 Sharing of R&D and Good practice

RSRL shares R&D successes and examples of good practice through the RSRL Waste Strategy Group (RWSG) and by attendance at the Nuclear Waste Research Forum (NWRF).

**RWSG** is a quarterly internal meeting chaired by the Waste Strategy Manager. With respect to technology management this forum aims to:

- share good practice, exchange ideas and support innovation within the SLC and with other SLCs
- act as a networking forum to ensure key people are aware of technologies available across the NDA estate and to raise awareness of technology gaps.
- inform key people and seek their assistance for work carried out by the Waste Strategy Team in support of NDA deliverables such as the Technical Baseline and Underpinning R&D Document (TBuRD), Integrated Waste Strategy (IWS), Prioritisation, and Hazard Baseline.

Changes to the technical baseline and waste strategy are not ratified at the RWSG but are subject to change control through the LTP programme controls process and governance arrangements.

**NWRF** is a quarterly external meeting with attendees from across the NDA, SLC's, regulators and other interested parties. Its aim is to encourage the sharing of R&D and technology development with the nuclear industry.

RSRL is also involved in numerous cross-industry collaboration, information exchange, and sharing of good practice activities although this involvement is limited due to funding constraints. Examples include:

- Attendance at national working groups such as the Clearance and Exemption Working Group (CEWG), the Nuclear Waste Research Forum (NWRF), the Inter-Industry Group on Contaminated Land (IIGCL), Nuclear Safety Advisory Committee (NuSAC) Research Review Group, High Active Waste Strategy Group, Low Level Waste Strategy Group, Waste Packagers Liaison Meeting and NDA working groups..
- Participation in the collaborative development of a cross-industry web-based database on waste minimisation.
- Attendance at conferences and workshops.
- Specific industry collaborations on particular issues. For example, RSRL has attended both NDA and CoRWM workshops relating to the interim storage of radioactive waste and RSRL is represented on the Encapsulated Metallic Uranium Steering Group (EMUS) and at the Hydrogen Forum.
- RSRL is a member of the CIRIA (Construction Industry Research and Information Association) operated by SD:SPUR and SAFEGROUNDS Learning Networks for developing and disseminating good practice on the sustainable management of materials and decommissioning wastes arising from nuclear sites and guidance on the management of radioactively and chemically contaminated land on nuclear and defence sites in the UK.

## 5.6 Coding of R&D Activities

During 2010 RSRL undertook an exercise to ensure that work activities in the LTP related to R&D were identified with a specific TBUrD code. This allows RSRL to retrieve R&D related work activities much more efficiently.