



NDA Chief Executive Tony Fountain met staff working on the decommissioning of a redundant fuel store and waste handling facility during a recent visit to Dounreay.

## **Dounreay Site Restoration Limited (DSRL)**

**FY 2011/12 Q1 Report  
Dounreay Stakeholder Group  
Site Restoration Sub-Group  
July 2011**

# 1. Safety Performance

## Safety Performance/Issues

Safety, Environmental and Security performance trends remain positive. There have been no nuclear safety, RIDDOR-reportable or 3-day lost time accidents since the previous meeting. Up to 30 June 2011, the site had recorded 377 days (3.60 million man-hours) without a >3 day Lost Time LTA, which is the second time that the site has achieved a period of over one year without a >3 day LTA. The site has returned a Total Recordable Injury Rate (TRIR) of 0.17 (0.17) and a Days Away Case Rate of 0.11 (0.11), as at 30 June 2011 (31 March figures in brackets), which remains within the NDA "green" range.

DSRL monitors a large number of safety metrics to identify any emerging trends and one is currently in the enhanced attention zone:

- A backlog of low level waste drums awaiting compaction has accumulated since January 2011 as a result of equipment faults at the Waste Receipt, Assay, Characterisation and Supercompaction Plant (WRACS). The plant resumed compaction operations in April 2011 and the backlog is reducing and will be cleared by the end of July 2011. This delay does not have any safety implications.

The proportion of staff appointed against each identified post requiring a concession was in the enhanced attention zone at the time of the last report but the backlog of refresher training has now been cleared.

The site experienced a complete loss of electrical power on 23<sup>rd</sup> May 2011, as a result of a north of Scotland wide power cut due to high winds. The site was without power for two and a half hours. Back up supplies for essential equipment operated as intended. Call out staff dealt with the backlog of failures through the night and the site was fully operational the following day. There was a limited amount of sampler downtime for gaseous effluent discharges. The Office for Nuclear Regulation (ONR) issued a positive fast stream report indicating that DSRL's emergency arrangements were effective and no safety event occurred.

The ONR interim report on the Japanese earthquake & tsunami identified 26 recommendations directed at themselves, government and the nuclear industry to determine whether any practicable improvements could be made to safety within the UK nuclear industry. In accordance with recommendation no. 26 (Way Forward) an interim response against each of the recommendations was prepared and submitted by DSRL. Following review and acceptance by the Dounreay Nuclear Safety Committee the response was successfully delivered to Mike Weightman, HM Chief Inspector, ONR within the required timescale of 17 June 2011. Of the 25 detailed ONR recommendations eight will require further work to be carried out. DSRL have advised ONR that a progress update on the eight responses will be provided at the end of July 2011, and this work is underway.

## Emergency Arrangements

The Annual Level 1 Site Demonstration Exercise held on 27 May 2011 was declared an adequate demonstration of the site's emergency arrangements by the Office for Nuclear Regulation. The scenario was based on a large NaK fire in the DFR sphere, which caused a plume of caustic gases to cover the north end of the Fuel Cycle Area (FCA). This exercise used DSRL's new Emergency Control Centre in D9995 for the first time and demonstrated the benefits of co-locating the Dounreay Emergency Control Centre, FCA Incident Control Centre, Emergency Radiological Incident Centre and Personnel Accountancy Bureau in a single facility.



Figures 1 & 2: Photos above were taken during the Annual Level 1 Site Demonstration exercise.

## Security Issues

There have been no security issues since the previous meeting. Discussions have been held with officials from the Department of Energy and Climate Change and Office Nuclear Regulation (ONR) Civil Nuclear Security (CNS) over recent months on changes that are required to the site's physical security requirements in the light of changes in security regulations and the government requirements. As a result of this a programme of work has been initiated to enhance existing fences, install additional anti-vehicle defences and change the personnel access arrangements. Most of the work will be undertaken by the local supply chain and be completed this year.

The Annual Counter Terrorist Exercise took place on the 30<sup>th</sup> June 2011. The exercise, which was based on the response to a terrorist incident on the site, was deemed a satisfactory demonstration by ONR(CNS).

## 2. Environmental Performance

All discharges since the previous meeting were within the sites authorised limits and there have been no environmental incidents.

SEPA were notified of higher than expected results from the environmental monitoring programme high volume air samplers, and of higher than expected results in rootmat and soil samples, which can be attributed to the effects from Fukushima. Unusual Occurrence Reports (UNORs) were raised and repeat samples have been taken where appropriate.

Access to Sandside Beach for monitoring purposes has been maintained and 21 particles were recovered over the period 1 April to 30 June 2011.

The planned 2011/12 programme of seabed survey and particles recovery work has now been concluded. A total of 351 particles were recovered and 30% of the 2012 scope was brought forward into 2011/12. The increased coverage was achieved as a result of the contractor being incentivised under the contract to make efficiencies, with most of the cost of delivering the accelerated scope being funded by in-year savings.

### 3. Operational Performance

Decommissioning in support of the hazard reduction mission continues to progress well; performance remains steady with a schedule performance index (SPI) for the year to date of 0.96. A table showing performance against the NDA's Operating Plan Targets for Dounreay for 2010/11 is attached in Appendix 1.

The following Operating Plan Targets have been achieved to schedule during the period:

- D021: Competition: Obtain NDA Approval for the PBO Competition Transition Plan;
- D028: Unirradiated Fuels Characterisation Facility: Complete the facility Hazard and Operability Studies (HAZOPs) and Preliminary Safety report (PSR).

All other in-year Operating Plan Targets remain on schedule with the exception of the following:

- CT D001: Bulk NaK Destruction at Dounreay Fast reactor (DFR). The plant remains shut down as a result of the blockages of the nitrogen feed system that occurred in June 2011. Replacement of the nitrogen line has been delayed by 3 weeks after the replacement valves failed their leak tests. An investigation into the cause of the failure indicated microscopic corrosion of the valve seats. The valves were returned to the manufacturer for refurbishment and they have now been repaired and the new sections of pipework successfully installed on the plant. Work has now commenced on reinstating the trace heating and lagging prior to sealing the vault and preparing the plant to recommence operations during w/c 18 July 2011. This delay means that achievement of the target of processing 305 batches (cumulative) by the due date is under threat. The potential for taking recovery action is limited as the plant is already operated on a shift basis.
- D07: Complete decommissioning of the D1251 Sentencing Tanks. This project started the year behind schedule as a result of delays that occurred during 2010/11. Inactive commissioning of the sludge recovery plant is now close to completion and it will commence operation in July 2011. The programme has been reviewed and there are considered to be opportunities to recover the slippage during the tank dismantling phase.

#### Major Project Performance

Table 1 below shows the performance metrics for the major projects at Dounreay:

Since 1 April 2009 through 3 July 2011

Project	Values in £ millions					CPI	Comments
	Planned	Performed	Cost	SPI			
Low Level Waste Repository	4.7	4.8	4.4	1.02	1.09	Slightly ahead of schedule, for each £ spent, £1.09 of scope is being performed.	
Dounreay Cementation Plant	13.1	13.1	11	1.00	1.19	On schedule, for each £ spent, £1.19 of scope is being performed.	
D1251 Complex Decommissioning	5.9	5.3	4.5	0.90	1.18	10% behind schedule, 18% under cost	
Offshore Particles Cleanup	4.8	6.9	6.1	1.44	1.13	44% ahead of schedule, 13% under cost	
Fuel Cycle Area Decommissioning	200.1	197.9	176.9	0.99	1.12	On schedule, 12% under cost	
PFR Decommissioning	34.7	34.1	29.8	0.98	1.14	2% behind schedule, 14% under cost	

**Table 1: Major Project Performance Metrics over the period 1 April 2009 to 3 July 2011**

Note: SPI is a measure of work performed against work planned, SPI > 1.0 = work ahead of schedule

CPI is a measure of cost of work performed against budget, CPI > 1 = work delivered below cost budget

## Reactor Decommissioning

Following a planned maintenance shut-down the DFR NaK Destruction Plant (NDP) resumed operation on schedule and destroyed 1 batch of primary NaK bringing the total primary NaK destruction to 37 tonnes. A blockage then occurred on the nitrogen feed system and attempts to clear it using heat and pressure failed and the plant entered into a repair phase. A detailed examination in the NDP shielded vault highlighted high radiation areas indicating a significant NaK blockage. The vault area has been flushed and man entries have been used to set up a number of nitrogen purged glove bags to allow the safe cut-out of NaK loaded pipework. Replacement of valves and pipework, radiography and trace heating will result in a 7 week outage with a restart planned for the third week of July 2011.

Mixer/breeder element retrieval from the PFR Irradiated Fuel Buffer Store has resumed following clean up of the Irradiated Fuel Cave crash glass windows, 11 cans have been recovered with 3 shipments of elements to the D2701 Intermediate Level Waste (ILW) store during the period.

2 loads of NaK wetted steel components have been successfully destroyed by the Sodium Inventory Destruction Plant (SID) in June. Revised operating regimes have been introduced following plant upgrades to the water filling and neutralisation systems to speed up the process.

Setting to work of the out of reactor DFR breeder fuel handling plant continues apace with recanning equipment trials and cell and flask handling line installations underway. Staff from Magnox Ltd have validated the DSRL Magnox Flash handling arrangements and a Magnox Flask for use in commissioning the leak test system was delivered to Dounreay in June 2011.

Manufacture and off-site testing of the equipment required to raise the Primary Cold Trap Loop (PCTL) components was completed during May and work has progressed with recommissioning of the PCTL vault heating system. The thermocouples have been re-connected and the heater elements set at low power to drive off moisture in an attempt to increase the insulation resistance to acceptable levels. The heating system is required to melt residual sodium ahead of attempts to raise the PCTL basket, heat exchangers and pumps.



Figure 3 shows a purge bag being fitted to the PCTL upstand during off-site component testing.

## Fuel Cycle Area Decommissioning

MTR Raffinate cementation operations continue to progress, cementing liquor from tank 11. Investigative work and trials are being progressed to improve the tank emptying capability thus reducing the size of heels left behind.

Assembly of the plant to treat the sentencing tanks at the Dounreay Materials Test Reactor complex has continued and the plant is undergoing inactive commissioning. The slippage that occurred in 2010/11 has been partially recovered and it is anticipated that the operating plan target will be met.

Decommissioning of D1206, the former reprocessing plant, is making good progress with safety case implementation and refurbishment of the manipulator decontamination gloveboxes underway. Previous delays in the breakdown cave and residues recovery plant decommissioning work due to the focus on safety case implementation work are still impacting on schedule delivery but these are expected to be mitigated by year end. Preparations are being made to replace a damaged window in the breakdown cave (see figure 4 below).

Work to remove contamination and seal the floor of the D1207 decontamination plant is now nearing completion in preparation for demolishing of the building, see figure 5 below.

Preparatory work in support of the D3100 Low Level Waste Repository project continues. Redundant portakabins have been relocated to the site and removal of redundant asbestos ducting from the new waste vault footprint has been carried out. A revised layout has been agreed which reduces the overall project cost.



Figures 4 & 5: D1206 Glovebox window replacement preparations and D1207 floor sealing work

## Fuels

The Nuclear Decommissioning Authority has published a report on its website setting out credible options for managing the breeder material from the Dounreay Fast Reactor. The NDA says there is a "clear and compelling strategic case" to remove the material from Dounreay and manage it at Sellafield with fuel from the Magnox power stations. Thirty tonnes of breeder material was sent from Dounreay to Sellafield in the late 1960s. The NDA has inherited another 44 tonnes of breeder material still at Dounreay. If the proposal to remove the material to Sellafield is approved by the NDA, the first movement by rail is expected to take place early in 2012.

## 4. Contractual Obligations

DSRL have proposed to the NDA to include a Socio Economics element to all competitive OJEU procurement tenders. One SLC on an NDA site in the UK has done this but issues were raised about breaching EU rules and the Tender competition was undermined. The NDA is working to overcome this issue and report back to the SLC's.

Having taken advice from legal, DSRL has published a draft procurement policy for Socio economics that details what can be done in competition but within the constraints to comply with European procurement laws. This policy will be issued to the NDA for endorsement.

In July, the NDA is convening a meeting with the SLC's and Tier 2 Contractors to develop a strategy for better engagement of SME's within the NDA estate. Outcomes from this meeting will be shared at a later date.

For Collaborative Procurement (CP) across the NDA estate, DSRL proposed that CP competitions for work at DSRL be issued with a list of suitably qualified local Contractors or suppliers whom could provide a service to support the scope of the project.

**It is important that DSRL cannot prescribe or nominate companies to the CP competitors but can provide contacts for the CP bidders to engage the local supply chain for pricing and support purposes etc.**

Major contracts awarded in the first Quarter of 2010/11 were:

Johnson Controls Ltd – cumulative FM contracts	£4.5 Million
Yorkon – Active Analysis Laboratory	£6.9 Million
MM Miller – Landfill 42	£200k
Nuvia – Engineering support	£360k
Nuvia – D1208 safety case	£280k

## 5. Other Issues

### Dounreay Management Competition

The NDA programme to compete management of the DSRL Parent Body Organisation has continued as planned. Teams from the two bidders for the competition (Babcock Dounreay Partnership and Caithness Solutions) have now completed their programme of site visits and are now working on their tender submissions.

### Employment Tribunal Rulings

An Employment Tribunal hearing on the remaining claims from a former employee was held on 20-24 June 2011. A claim of sex discrimination was withdrawn midway through proceedings due to lack of evidence and the remaining claims of unfair and constructive dismissal were dismissed.

A separate Employment Tribunal has concluded that the TUPE regulations do not apply to the former Nuvia shift staff from PFR and the case brought against DSRL has therefore been dismissed.

## New Driver Training Facility

DSRL has recently opened a new facility at Ormlie for specialist vehicle and plant operations training. Training staff are accredited by the National Plant Operators Registration Scheme (NPORS), and are working towards accreditation by the Construction Plant Competency Scheme (part of the CITB). By the end of the year they hope to be able to deliver accredited vocational training such as SVQs.

The trainers work with small numbers on a course, which means that they can give them valuable practice time on the machinery. Training is mainly aimed at DSRL staff and other contractors at Dounreay, but are finding that they are getting more work through word of mouth. Local companies who have benefited from training, apart from Dounreay, include Scrabster Harbour and CalMac (Northlink Ferries) and it is expected that before long the facility will be used by companies from further afield.



Figures 6 & 7: New specialist driver training facility at Ormlie.

## Television Coverage

A film crew from BBC's "Bang Goes the Theory" spent two days in and around the site recording material for the programme. Radioactive waste forms part of the 30-minute programme, which examines nuclear energy in light of the UK Government's renewed interest in the technology and the recent accident in Japan. Presenter Dallas Campbell will lead the segment featuring radioactive waste. Dallas and the film crew visited the Land and Marine barge anchored near Dounreay to see how a clean-up team recovers radioactive waste from the seabed. Later, they visited the beach at Sandside where particles of nuclear waste are washed ashore. The team also went inside the Dounreay Fast Reactor to discover what happens to radioactive waste from its decommissioning. Among those interviewed by Dallas was Mike Brown, who is in charge of dismantling the site's fast reactors. The next series of *Bang Goes the Theory* is due to begin in August.

Dounreay is also set to feature in BBC TV's "The One Show". The prime-time weekday programme is doing a piece about what the environment looks like at a nuclear site. Unmanned cameras will be installed on the Dounreay site in July to capture some of the wildlife that inhabits Dounreay. Later in July, a film crew will visit the site to interview environmental staff about how the nuclear industry co-exists with nature on a site like Dounreay. No date for the broadcast is available at the moment.



## 6. Site Statistics – at a glance

(as of 30 June 2011 unless stated, with 31 March 2011 figures shown in brackets)

### PROGRAMME DELIVERY

#### Schedule performance index (SPI)

Year to date	Year-end forecast
0.96 (1.01)	0.98 (1.01)

\* SPI measures work actually carried out against the agreed NDA schedule.

### COST PERFORMANCE INDEX (CPI)

Year to date	Year-end forecast
1.09 (1.13)	1.02 (1.11)

\* CPI measures the cost of work actually carried out against the forecast agreed with the NDA. A figure of 1.0 equals the cost agree; greater than 1.00 reflects efficiency gains.

### NDA OPERATING PLAN TARGET STATUS

Base Targets due/achieved to date in 2011/12	2 of 2 achieved
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\* These are agreed milestones with NDA which results in payment of fee.

### PRODUCTION

	April to May 2011	2010 – 2011 total
Low-level waste processed for disposal	725 drums	3,176 drums
Raffinate liquor converted to solid intermediate waste	50	514 drums (397 drums)

### HEALTH AND SAFETY

	April to June 2011	2011 – 2012 total
Number of reportable radiological events:	0 (0)	0 (0)
Number of events on International Nuclear Event Scale:	0 (0)	2 (2)
Number of Lost Time Accidents (LTA)	0 (0)	1 (1)
Total Recordable Incident Rate Compare injury and illness rates per 20,000 hours worked	0.17 (0.28)	
RIDDOR reportable occurrences	0 (0)	1 (1)
Hours worked since last LTA	3.60 million (2.85 million)	
Average individual radiation dose (DSRL)	0.02 mSv for year to date	
Average individual radiation dose (non-DSRL)	0.04 mSv for year to date	

### ENVIRONMENT







	May 2011	2011 – 2012 total
Events reported to regulator	0	0
Amount of paper recycled	0	6,710 kg
Amount of metal recycled	26,920 kg	78,060 kg
Amount of cardboard recycled	5980 Kg	5980
Particles recovered from local beaches	5 (1)	29 (10)

**PEOPLE**

	<b>March 2011</b>
Full time DSRL staff	812 (834)
Part time DSRL staff	65 (67)
Contractor staff	893 (899)
Gate-held passes (infrequent use)	160 (165)

Dounreay Site Restoration Ltd  
13 July 2011

# Appendix 1: Operating Plan Targets 2011/12

DSRL Operating Plan Targets		Target 2011/12				Performance to Period End		Forecast to Completion			Commentary
		Q1	Q2	Q3	Q4	Plan	Actual	April	May	June	
Unique Ref No	Target										
<b>Bulk Sodium Potassium (NaK) destruction at Dounreay Fast Reactor</b>											
CT D001	Destroy cumulative batch number 305.			80		27	8	80	80	80	Replacement of the nitrogen line was delayed by 3 weeks as the spare valves failed to seal and had to be refurbished by the manufacturer. The plant will return to operations in the third week of July 2011.
<b>Removal of spent fuel cans (176) from the PFR buffer store and pond matrix</b>											
CT D003	Remove 176 spent fuel cans (remaining 39 programmed for 2013/14)				34	11	21	34	34	34	10 Spent Fuel Cans of mixer/breeder elements were removed from their PFR Irradiated Fuel Buffer Store in June 2011
<b>Remove and destroy sodium from contaminated material at the Prototype Fast Reactor Plant</b>											
D004	Sodium Inventory Disposal Plant (SID) - Process loads of Alkali Metal through SID			17	4	4		17	17	17	2 loads of NaK wetted steel components were processed during June 2011.
<b>D1207 LLW Facility</b>											
D006	Demolish redundant D1207 LLW facility to slab level in accordance with the mission to decommission the site			x				31/03/2012	31/03/2012	31/03/2012	North upper walls and laundry lower wall completed
<b>Complete Decommissioning of sentencing tanks at Dounreay Materials Test Reactor</b>											
D007	Complete decommissioning of the D1251 Sentencing Tanks			x				13/07/2012	04/06/2012	30/05/2012	Inactive commissioning is virtually complete and all efforts are being progressed to recover the delay in the programme
<b>D1200 Laboratory Complex</b>											
D010	Complete Lab #90 cell 2 decommissioning			x				31/01/2012	31/01/2012	31/01/2012	Cell 2 decommissioning has commenced the walls have been removed and floor dismantlement is ongoing
<b>D1206 (PFR reprocessing plant) Decommissioning</b>											
D013	D1206 (PFR reprocessing plant) refurbish decontamination glovebox		x					25/08/2011	25/08/2011	25/08/2011	Airline suit entries ongoing
D014	D1206 Zac Fuel removed from facility			x				08/12/2011	08/12/2011	08/12/2011	Safety documentation for the removal of fuel is being prepared
<b>Removal and Treatment of Out Of Reactor Material - Work collaboratively with Sellafield to achieve agreement of the early off-site transfer of material to Sellafield</b>											
D017	Complete installation of equipment in D2001 plant for loading flasks with Breeder Fuel		x					29/07/2011	29/07/2011	29/07/2011	An assurance visit by Sellafield and Magnox staff, accompanied by the DFT and the NII to witness the filling of recan tubes in D2001 has been organised for the 19th July 2011. This visit will also allow Sellafield and Magnox staff to audit the Out of Reactor (OoR) breeder process as part of their own assurance requirements for accepting our fuel into the Magnox flasks or the Sellafield reprocessing plants. The Breeder Fuel recanning machine is currently being actively tested in a remote handling facility.
CT D018	Capability to dispatch 2 out of reactor breeder flask rail shipments to Sellafield				x						Stage no longer in 2011/12. PBI agreed stage 'Complete demonstration of readiness to ship' Q4 2011/12. DSRL will be in a state of readiness to ship breeder fuel to Sellafield in Q4 2011/12. The magnox flask DFT submission is on schedule. Discussions continue with Direct Rail Services (DRS) with a view to letting a transport contract immediately after NDA approval of the final business case. Commissioning of the flask leak detection system was progressed in June 2011 and will be completed by July 2011.
<b>Ongoing support to the DSRL PBO Competition, completing Transition and Exit plans and ensuring DSRL treat all participants equally</b>											
D021	Obtain NDA approval for the transition plan		x					30/06/2011	30/06/2011	23/06/2011	Draft Transition Plan submitted as part of 2010/11 PBI was a very advanced draft. Only update required is to add some further detail to the handover packs - the final one of these was sent 23/06/11. Stage claim submitted 27/06/11 and approved by the NDA on 04 July 2011.
D022	Complete transition to new PBO				x			31/03/2012	31/03/2012	31/03/2012	All DSRL activities to achieve this are on schedule. Final details of the transition required can only be confirmed once the Preferred Bidder and individual posts are known (Nov-11). Transition plan has been endorsed by Dounreay Nuclear Safety Committee in May-11 with only minor comments. This will be followed by formal submission to the regulators.
<b>D3100 LLW Repository</b>											
D023	Complete design of the D3100 new LLW repository			x				15/10/2011	12/10/2011	12/10/2011	The delivery in the early days of the contract has been slower than anticipated. An Early Warning has been raised to highlight the issue of delivery to the contract requirements. A risk reduction meeting has been held and this has resulted in a step change to the delivery and the identification of additional personnel to augment the delivery team.
<b>New Active Analysis Laboratory</b>											
D025	Complete detail design of the new active analysis laboratory			x				15/12/2011	15/12/2011	15/12/2011	Design process underway and project progressing to schedule.
<b>Unirradiated Fuels Characterisation Facility (UFCF)</b>											
D028	Unirradiated Fuel Characterisation Facility Hazard & Operability Study (HAZOPs) and Preliminary Safety Report (PSR) Complete			x				23/06/2011	23/06/2011	22/06/2011	PBI delivered
<b>SOCR</b>											
CT D030	SOCR				-10%			31/03/2012	31/03/2012	31/03/2012	Draft SOCR plan for 2011/12 suggests that this target should be comfortably met.
<b>RAG STATUS</b>											
	Red Black Cross - Target lost irretrievably										
	Red - Behind target: with little possibility of recovery										
	Amber - Behind required target: with possibility of recovery										
	Green - As target or better										
	Blue - target has been achieved on or ahead of schedule										
	Blue Red Cross - target achieved behind schedule										

