

SAFETY DIRECTORS FORUM

NUCLEAR INDUSTRY ACCIDENT AND DOSE DATA 2006-7

Compiled by

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Secretary

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FOREWORD

This report is a compilation of accident and dose data for the nuclear Licensees and the MOD Authorisees in Great Britain. Data is presented for either the calendar year January to December 2006, or financial year April 2006 to March 2007, as appropriate. The report also includes data on unplanned power reactor trips, formal environment health and safety ‘notices’, and prosecutions.

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Data is for either calendar year 2006 or financial year 2006-7.

All accident rates are stated per **100,000 hours** (not 200,000 hours).

RIDDOR injuries include deaths, major injuries and more than 3 day absences, which are required to be reported to HSE.

RIDDOR major injuries are as defined in RIDDOR, which are required to be reported to HSE.

OSHA DACR = Days Away Case Rate, triggered when the next day of scheduled work is missed.

OSHA TRIR = Total Recordable Incident Rate, includes DACR plus specified accidents causing injury plus specified diseases.

N/A = Not Applicable.

n/a = Not Available.

E = employees.

C = contractors.

Table 1: Civil Nuclear Licensees - Accident and Dose Data 2006-7

	Urenco (Capenhurst) Ltd.		Sellafield Ltd		Magnox Electric Ltd		Springfields Fuels Ltd		UKAEA		British Energy Generation		GE Healthcare	Imperial College
	E	C	E	C	E	C	E	C	E	C	E	C	E	E
RIDDOR injuries / 100,000 hours	0	n/a	0.11	0.20	0.08	0.03	0.17	0	0.09	0.19	0.13	0.10	0.25	0
OSHA DACR / 100,000 hours	0	n/a	0.16	0.24	0.13	0.06	0.24	0	0.21	0.21	0.13	0.10	0.61	0
OSHA TRIR / 100,000 hours	0	n/a	0.19	0.47	0.21	0.21	0.31	0	0.45	0.45	n/a	n/a	0.83	0
RIDDOR Major Injuries/ No. Of persons	0/ 415	n/a	2/ 9019	4/ 2716	0/ 3734	0/ 1948	1/ 1527	0/ 324	1/ 1686	1/ 2328	1/ 5939	1/ 4331	0/ 1350	0/14
Collective Dose (Sv)	0.126	0.043	8.28	3.14	0.408	0.873	1.2	0.13	0.16	0.56	0.602	2.047	0.725	0.0015
Average Dose (mSv)	0.39	0.37	0.95	1.02	0.106	0.132	0.8	0.4	0.10	0.20	0.117	0.245	0.77	0.16
Employees in dose ranges 0-5 (mSv)	325	117	8620	2955	3841	6571	1491	324	1598	2720	5108	8221	930	11
5-10	0	0	75	122	0	20	1	0	0	17	23	130	16	0
10-15	0	0	0	0	0	0	0	0	-	-	0	73	0	0
> 15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unplanned trips / Reactor year (7000 hrs critical)	N/A		N/A		0.16		N/A		N/A		0.63		N/A	4
INES Level 1 Events	0		5		4		0		1		44		N/A	1
INES Level 2+	0		0		0		0		0		0		0	0
Enforcement Notices	0		1		0		0		3		3		2	0
Prosecutions	0		1		0		0		1		0		0	0

Notes to Table 1:

Urenco (Capenhurst) Ltd.

The data reported is for the calendar year 2006 and relates solely to the operations undertaken by the licensee Urenco (Capenhurst) Limited. Urenco (Capenhurst) Limited is part of Urenco Enrichment Company, which in turn is part of the Urenco Limited group of companies.

RIDDOR Major Injuries: the 415 persons reported represents 389 Urenco (Capenhurst) Limited employees and 26 hired/fixed term contract personnel working under UCL's direct supervision.

Although total numbers of RIDDOR and OSHA contractor accidents are measured, the number of hours worked by contractors is not currently measured and hence the contractor safety performance data requested is not available. However, for information 1 contractor OSHA Days Away Case Accident, which was also reportable as a RIDDOR Major Injury, was reported during 2006.

Employee dose data: the reported data is for the 325 employees who are designated as Radiation Workers (i.e. those who routinely work with ionising radiation and are subject to routine dose assessment and recording). The data includes those individuals whose dose was assessed to be zero. 28 of the 325 employees were formally designated as Classified Persons. The collective dose for the 28 Classified Persons was 24.6 mSv and the collective dose for the other 299 Radiation Workers was 101.6 mSv.

Contractor dose data: the reported data is for the 117 contractors who are designated as Radiation Workers for work at UCL (i.e. those who routinely work with ionising radiation and are subject to routine dose assessment and recording). The data includes those individuals whose dose was assessed to be zero. None of the 117 contractors were formally designated as Classified Persons.

Sellafield Ltd

The data reported is for operations undertaken by Sellafield Ltd including Capenhurst & International Nuclear Services. Data presented is for Financial Year 2006/07 except for the dose figures which are reported for calendar year 2006.

The 'Employee' column incorporates information from Employed and Hired staff, defined as follows:

- *Sellafield Ltd Employee*
Employee of Sellafield Ltd subject to Sellafield Ltd Line Management responsibility and work in accordance with Sellafield Ltd Procedures.

- *Hired staff*
Consist of a combination of Agency Supplied Workers and Contractor Supplied Workers.
 - *Agency Supplied Workers (ASW)* - ASWs are supplied by employment agencies to work for Sellafield Ltd under a contract between Sellafield Ltd and the relevant Employment Agency (or body acting on their behalf) and are subject to Sellafield Ltd Line Management responsibility. Agency Supplied Workers are not, as a matter of law, employees of Sellafield Ltd. However, for the purposes of health and safety requirements only, they are regarded as Sellafield Ltd employees and they work in accordance with the Sellafield Ltd Procedures in which they provide their services.
 - *Contractor Supplied Worker (CSW)* - CSWs are similar to Agency Supplied Workers in that they are supplied by an external organisation which is contracted to provide human resources to Sellafield Ltd. CSWs are subject to Sellafield Ltd Line Management responsibility on a day to day basis. They must work to Sellafield Ltd Procedures *not* their own company's procedures. CSWs must reside full time on a Sellafield managed site, preferably close to the Line Manager and work solely for that Line Manager. If the contract/employment period is less than one month, the individual cannot be designated as a CSW unless otherwise agreed by the Resident Engineer.

The 'Contractor' column incorporates information from Contractors, defined as follows:

- *Contractor's Employee*

An individual supplied by an external organisation which is contracted to supply goods and services to Sellafield Ltd who is not subject to Sellafield Ltd Line Management responsibility on an individual basis. Consultants are also included in this category, as are Agency staff who are supervised directly by their Agency as opposed to Agency Supplied Workers.

RIDDOR Major Injuries: the No. of persons has been calculated on an average basis across the financial year.

Dose data: Reported for calendar year 2006. Contractor doses exclude International Nuclear Services. Figures are provided for all Classified Persons including those with 'zero dose'.

INES Level 1 events: Provided for Financial Year 2007. Five events identified:

- Clean cooling water tank moved from it's supports
- Stack discharge exceeded authorisation limit
- Shower active water leakage
- Breach of Operating Rule
- Release exceeding IRR notification level

Enforcement notices: An Enforcement Notice was received on 18th January 2007 relating to holes found in Sealine 3 on 24th August 2006.

Prosecutions: Sellafield Ltd was prosecuted during 2006/2007 regarding leak of product dissolver liquor within THORP on 20th April 2005.

Magnox Electric Ltd

Data supplied relates to financial year 2006/2007 except for dose data which is presented for calendar year 2006.

RIDDOR major injuries: No. of persons based on period 12 of financial year 2006/ 2007.

INES Level 1 events:

- 07/08/2006 - Oldbury - Reactor 1 Flux Trip Unit - A routine daily check of guardline flux trip unit settings was carried out, which on occasions requires the unit to be adjusted. The trip units DID require adjustments, but the units were NOT adjusted, and this fact recorded by the DAP for the reactor desk. This was not in compliance with the plant operating instructions and therefore judged to be a breach of an Operating Rule.
- 14/08/2006 - Trawsfynydd - Maintenance Schedule - Failure to manage extensions to maintenance schedule item intervals.
- 07/01/2007 – Sizewell Effluent Treatment Plant (ETP) Ponds Recirculation line - A major fracture of a 10 inch Durapipe ponds recirculation line caused the pond water to flood the ETP plant areas. The emergency services were called.
- 02/02/2007 – Sizewell - Reactor 2 - The gas circulator auxiliary motors on the in service circuits 2C and 2D tripped. The loss coincided with maintenance work being carried out on Reactor 1 Gas circulators auxiliary motor equipment. There is an interconnection between the auxiliary motors of both reactors and this appears to be the immediate cause of the trip. The operating rules require that at least one circuit is in service with its auxiliary motor running following a shutdown period of greater than 10 days, although the safety case allows a period of up to 30 hours with no auxiliary motors in 2C and 2D circuits were returned to service at 18.02 hours on the same day.

Springfields Fuels Ltd

Data presented is for Financial Year 2006/07 except for the dose figures which are reported for calendar year 2006.

Unplanned trips/ Reactor year: Not Applicable as site does not operate a reactor.

UKAEA

Data provided corresponds to financial year 2006/07 except for dose information which corresponds to calendar year 2006 for both UKAEA and its Contractors.

OSHA DACR & OSHA TRIR: Provided as a combined figure for employees and contractors.

Dose Data:

- The radiation dose information is provided for calendar year 2006 for both UKAEA and those of its Contractors who either use Nukem as the ADS or who are 'double badged'. Zero dose radiation workers are included in the average dose calculation.
- The caveat to the radiation dose data is as follows, "Data for employees of some contracting companies is not retained centrally by UKAEA - however the data presented here reflects the major proportion of radiation workers on UKAEA sites."
- Data relating to Tenants is not included in any of the figures.
- The figure shown against 5-10mSv represents staff who have received dose in the range 5-15mSv and hence a dash is shown against 10-15mSv range.

Unplanned trips/ Reactor year: Not applicable as there are no operating reactors.

INES Level 1 Event: Windscale – B13 shield door interlock anomaly.

Enforcement notices:

- Dounreay – NII – Improvement Notice received under LC4(2) as a result of inadequate arrangements for the storage of load bricks. The packages had inadequate levels of containment, inadequate means of physical protection and inadequate marking /labelling.
- Dounreay – NII – Improvement Notice received under LC25(1 & 2) as a result of inadequate records of the origin of the above packages.
- Windscale – NII (B13 Operations), details to be confirmed.

Prosecutions:

- SEPA – UKAEA was fined £140,000 after pleading guilty to four charges about the unauthorised disposal of radioactive waste at Dounreay between 1963 and 1984. The charges related to the excavation of contaminated ground and its disposal to Landfill 42 and the discharge of radioactive particles to the sea. Only the shaft and LLW pits were authorised for the disposal of solid radioactive waste.

British Energy Generation

Data presented is for Financial Year 2006/07 except for the dose figures which are reported for calendar year 2006.

RIDDOR injuries & OSHA DACR: Contractor figure is for station-based contractors only.

OSHA TRIR: Not available as indicator not used.

RIDDOR Major Injuries: Number of contractors is estimated FTEs (station-based).

Dose Data:

- Numbers of people in the lower dose bands are based on aggregating site figures and so there may be a small number of people who are counted more than once or whose dose received at several sites would move them into the 5-10 band. The number in the 10+ range has been separately verified as part of the administration of the Company Dose Restriction Level.
- The maximum dose to any individual was 11.657mSv.

Enforcement notices:

- 25/4/2006 – Sizewell B power station. Environment Agency enforcement notice requiring improvements to the arrangements for monitoring and sampling radioactive discharges.
- 20/6/2006 – Heysham 2 power station – Improvement Notice – arrangements for the examination, inspection, maintenance and testing of all fire dampers related to securing the integrity of nuclear safety barriers required by the station safety case.
- 5/9/2006 – Hinkley Point B power station. Immediate Prohibition Notice – Dangerous access to overhead crane – charge hall.

GE Healthcare

All data corresponds to Calendar Year January to December 2006.

Collective Dose: 946 Individuals of which 37 had doses recorded as 0mSv.

Enforcement notices: 2 Enforcement notices served by the Environment Agency.

Imperial College

Data provided corresponds to calendar year 2006.

Unplanned trips/ Reactor year: 2 reactor operating, 2 reactor shutdown.

INES Level 1 events: Fuel element dropped by <1m back into tank storage hole.

Enforcement notices: None, but failed 2 emergency exercises.

Table 2: Defence Nuclear Licensees/ Authorisees - Accident and Dose Data 2006-7

	AWE		BAE Systems		Rolls-Royce Marine Power		Vulcan NRTE		HMNB Clyde		Devonport Royal Dockyard Ltd.		HMNB Devonport		Babcock	
	E	C	E	C	E	C	E	C	E	C	E	C	E	C	E	C
RIDDOR injuries / 100,000 hrs	0.07	0.26	0.51	n/a	0.463	0	0.21	1.36	0.52	n/a	0.48	n/a	0.4	0.15	0.79	0
OSHA DACR / 100,000 hrs	0.13	0.61	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.66	n/a	N/A	N/A	0.30	0.08
OSHA TRIR / 100,000 hrs	0.26	1.39	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.67	n/a	N/A	N/A	1.10	0.08
RIDDOR Major Injuries/No. of persons	2/4428	0/600	1/3286	n/a	2/292	0/57	0	0	3/2284	n/a	10/5560	n/a	2/469	0	0/1200	0/400
Collective Dose (Sv)	0.25	0.13	0.0061	0.0095	0.042	0.005	0.06982	0.01842	0.109	0.036	0.504	0.123	0.013	0.075	0.012	0.004
Average Dose (mSv)	0.10	0.15	0.047	0.109	0.38	0.48	0.28	0.21	0.199	0.308	0.29	0.12	0.10	n/a	0.104	0.037
Employees in dose ranges																
0-5 (mSv)	2493	782	130	87	119	10	245	86	487	117	1742	968	164	n/a	114	119
5-10	0	0	0	0	0	0	0	0	0	0	0	0	0	n/a	0	0
10-15	0	0	0	0	0	0	0	0	0	0	0	0	0	n/a	0	0
> 15	0	0	0	0	0	0	0	0	0	0	0	0	0	n/a	0	0
Unplanned trips / Reactor year (7000 hours critical)	N/A		N/A		N/A		6		n/a		N/A		n/a		N/A	
INES Level 1 Events	0		0		0		0		0		1		0		3	
INES Level 2+	0		0		0		0		0		1		0		0	
Enforcement Notices	0		0		0		0		0		2		0		0	
Prosecutions	0		0		0		0		0		0		0		0	

Notes to Table 2

AWE

All data provided corresponds to financial year 2006/07.

Unplanned trips/ Reactor year: Not applicable since not operating reactor.

BAE

All data provided corresponds to financial year 2006/07 except for dose data which covers 2006 calendar year.

The conventional H&S information for contractors is n/a as hours worked and head count information not available.

OSHA DACR and OSHA TRIR: metrics not used and hence marked as not applicable.

Dose data: provided for Barrow premises during 2006 calendar year. Collective and average doses reported include all radiation workers (Classified and Written Arrangements Persons) working in designated areas.

Unplanned trips/ Reactor year: Not applicable since not operating reactor.

Rolls-Royce Marine Power

All data supplied corresponds to calendar year 2006.

OSHA DACR and OSHA TRIR: metrics not used and hence marked as not applicable.

Vulcan NTRE

Data supplied corresponds to calendar year 2006.

OSHA DACR and OSHA TRIR: metrics not used and hence marked as not applicable.

Unplanned trips/ Reactor year: Figure supplied corresponds to unplanned reactor scrams.

HMNB Clyde

Data supplied corresponds to calendar year 2006.

OSHA DACR and OSHA TRIR: metrics not used and hence marked as not applicable.

Devonport Royal Dockyard Ltd.

All data provided corresponds to financial year 2006/07 except for dose data which covers 2006 calendar year.

Fields marked n/a for contractors is where data on these metrics is not collected.

Unplanned trips/ Reactor year: Not applicable since not operating reactor.

INES Level 1 events: 1 event – leakage of radioactive liquid.

INES Level 2+ events: 1 event - no nuclear or radiological implication but exposed safety culture issues.

Enforcement notices: 2 – Improvement notices (NII).

HMNB Devonport

All data supplied corresponds to calendar year 2006.

RIDDOR Injuries: 5 RIDDOR injuries (employees), inclusive of two major injuries. 5 RIDDOR injuries (contractors) (over 3 day absence). Contractor figure assumes 1500 contractors on site.

OSHA DACR and OSHA TRIR: metrics not used and hence marked as not applicable.

RIDDOR major injuries: 2 RIDDOR major injuries (employees) for the calendar year 2006. No major injuries (contractors) for the calendar year 2006.

Collective dose: Figures represent dose accrued on the Naval Base site for calendar year 2006. Contractor figure includes 0.043Sv accrued by Submarine crew whilst alongside at HMNB Devonport.

Average Dose: Figure represents the average dose accrued by MoD Devonport personnel for calendar year 2006 – including dose accrued on other sites. The ‘average dose’ information for ‘contractors’ is not available since the total number of Submarine Crew is not recorded on the Naval Base dosimetry system.

Unplanned trips/ Reactor year: Not recorded on the Naval Base.

Babcock

Data supplied corresponds to financial year 2006/07 except for dose data which is supplied for calendar year 2006.

Dose data: Average dose is calculated on all radiation workers (Classified and Written Arrangements Persons).

Unplanned trips/ Reactor year: Not applicable since not operating reactor.

Appendix 1: Safety Directors Forum Members

Civil Nuclear Operators

Neale Brittain	British Energy
Mike Potts	UK Atomic Energy Authority
Paul Thomas	BNFL Plc
Alan Brandwood	Magnox Electric Ltd.
David Mason	British Nuclear Group (Sellafield)
Jim MacHardy	GE Healthcare (International)
Jenny Chalmers	Urenco
Geoff Gill	Springfields Fuels Ltd
Simon Franklin	Imperial College

Defence Nuclear Operators

Capt Rob Wormald	HM Naval Base Clyde
Heather Young	AWE, Aldermaston
Tim Chittenden	BAE Systems, Barrow
A H (Frank) Francis	Devonport Royal Dockyard Ltd.
Capt John Coulthard	Defence Procurement Agency
Stuart Fowell	Babcock, Rosyth Royal Dockyard
Andy Gordon	Rolls Royce Marine Power Operations, Derby
Cdr Nigel Canty	Vulcan Naval Reactor Test Establishment
Capt John J Taylor	HM Naval Base Devonport

Secretary

Jane Climpson	Devonport Royal Dockyard Ltd.
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Notes:

1. The above were the members of the Safety Directors Forum at the time this report was written.
2. Since the previous report:

Neale Brittain has replaced Peter Webster at British Energy
Simon Franklin from Imperial College has joined the SDF as a full member
Capt Rob Wormald has replaced Mike Wareham at HM Naval Base Clyde
Cdr Nigel Canty has replaced Cdr Charles Hume at Vulcan Naval Reactor Test Establishment.

Heather Young has replaced Andrew Jupp at AWE, Aldermaston
Tim Chittenden has replaced Tony Burbridge at BAE Systems, Barrow
Capt J Coulthard has replaced Capt JJ Taylor as Nuclear Authorisee
Capt JJ Taylor has replaced Capt J Coulthard at HM Naval Base Devonport