

L2 Newsletter

January 2015: Issue: 7



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This is our seventh newsletter aimed at our customers and other stakeholders with an interest in our activities.

This issue includes the latest information on our recent activities, regulatory developments and a number of learning from experience opportunities.

It has been another busy year in the UK Nuclear New Build market with more positive progress on all three developments. One of our key clients, NuGeneration Limited, now made of a joint venture of Toshiba and GDF Suez, has had a very busy six months with aims to have its first AP1000 reactor on-line by 2024 – and for all three units with an estimated output of 3.4 GW to be connected to the grid by the end for 2026. The Moorside project is potentially the largest nuclear project in Europe. Alongside the practical aspects of the project NuGen has signed a co-operation agreement with HM Treasury to promote financing for the Moorside project in West Cumbria. L2 have been providing regulatory and technical consultancy services for the last three years and our work continues into 2015 supporting the site suitability phase of the work and beyond.

In the decommissioning sector, the recent announcement from NDA/DECC over the future management of the Sellafield site will see significant potential changes in the approach and delivery strategy for the site with direct control being assumed by NDA over the next 15

months. There are plans to adopt a new Strategic Partner business model and also continued engagement of the supply chain in the delivery of the site clean-up. Through 2014, L2 were fortunate to be teamed with our partners MWH Global in securing a technical services and project support contract to the Low Level Waste Repository (LLWR) for the next four years and we look forward to developing our relationship with them. In radiological protection space, this newsletter contains a number of important learning from experience issues around radiography work plus the latest thinking on radiological protection safety culture. We have also included an item on the future implementation of the EU Basic Safety Standards Directive which will result in a revision of the Ionising Radiation Regulations in the UK. The newsletter also contains an update on the latest changes in the transport of radioactive materials including the latest versions of ADR2015 and IMDG2014. Along with this we have also include some learning from experience that we have gained from audit/inspection of transport radioactive materials and wastes.

Update on BSSD (2013/59/ EURATOM) Implementation

The European Union published their latest Directive on the Basic Safety Standards (BSSD) for Protection against the dangers arising from exposure to ionising radiation in January 2014. The BSSD brings together 5 directives covering:

- Basic Safety Standards
- Medical Exposures
- High Activity Sealed Sources
- Outside Workers
- Public Information

The main changes relating to public protection include the use of a graded approach, closer alignment with ICRP and IAEA standards, a revised definition of high activity sealed sources (HASS) and the use of IAEA 'D-values', an increased emphasis on managing orphan sources and the use of reference levels for contaminated land. The transposition date is February 6th 2018.

The new BSSD follows the International Commission on Radiological Protection report ICRP 103 – The 2007 Recommendations of the ICRP. These Recommendations propose a revised System of Radiological Protection which evolves from previous process-based systems of radiation practices and interventions to an approach based on the characteristics of 'situations' eg. existing situations, planned situations and emergency exposure situations. The new BSSD now also covers all categories of exposure namely occupational, public and medical and therefore repeals existing directives covering Outside Workers, Medical Exposures, HASS and REPPIR.

The new BSSD contains a range of new and amended measures with key points being:

- There are reduced annual dose limits for the lens of the eye (down to 20mSv)
- Employers carrying out practices may need to be licensed
- Holders of individual X-ray sets may be required to notify the HSE
- Radon in the workplace is to be considered as an existing exposure situation but is to be managed as a planned exposure situation. Dose limits for radiation workers are to take into account the contribution from radon

- Protection of the environment is considered in the context of long-term human health
- Non-medical imaging exposures are required to be justified in the same way as medical exposures
- Consideration of existing public exposure situations are included such that radon and gamma emitting nuclides in building materials will need to be assessed
- New defined term "Radiation Protection Officer" for someone competent for a practice – could be equivalent to UK Radiation Protection Supervisor depending on HSE development of the concept. Accreditation of RPO is at HSE discretion.



The HSE are the lead for implementation and currently holding consultations with stakeholders. Once it is clear what legislative gaps exist and where change is needed, a decision will be made on whether existing legislation is to be revised or replaced ie IRR provisions in ACOP and/or regulations.

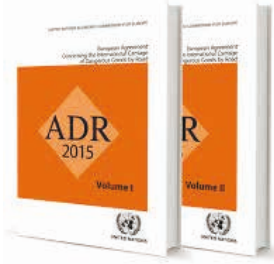
An initial analysis of the new BSSD indicates that UK legislation already covers the majority of the Directive and the UK Government is keen to minimise the impact of any changes. Matters which have not been changed include:

- Whole body and extremity dose limits for classified persons, 16-18 year olds and public as relevant
- Protection of pregnant and nursing mothers
- Classification and Medical Surveillance
- Approved Dosimetry Services
- Requirements for Training
- Requirements for RPAs
- Requirement for Local Rules
- Categorisation of Designated Areas and additional measures including signage
- Monitoring – areas and personnel
- HASS and orphan source provisions for including security and financial provisions

We await the new Ionising Radiations Regulations sometime in the next few years.

Regulatory Update - RAM Transport

The guidelines and regulations regarding the transportation of radioactive dangerous goods by road have come into force on 1st January 2015 in the form of ADR2015.



The majority of the changes do not affect radioactive materials (Class 7) transport, with only minor changes from ADR2013. ADR2015 has clarified that for Type A provided that there are no more than 10 packages are carried, and the sum of

the TIs does not exceed 3 and there are no subsidiary hazards then the driver does not require to be ADR qualified. However, the driver must have received general awareness training for which the driver shall have been issued with a suitable certificate.

Other key changes to the ADR include:

- Transportation of used and damaged lithium-ion batteries
- Twenty new UN numbers, primarily for absorbed gases
- The sizes of danger label models and other signs have been precisely proscribed, there is a transition period until 21/12/2016
- The Emergency Instructions in Writing as given in 5.4.3.4 has been amended to prohibit the use of electronic cigarettes along with other minor amendments for the vehicle crew. There are also other amendments to the Instructions in Writing, therefore revised Instructions in Writing must be provided to drivers. As a transitional measure the ADR2013 Instructions in Writing can be used until the end of 2017
- A specific UN number (3509) has been introduced for uncleaned empty packaging
- The revised regulations include new formulas for the calculation of the maximum permissible fill level for tanks containing environmentally hazardous substances and substances that pose a subsidiary environmental risk
- The exemption regulations for the transportation of light sources that contain hazardous substances have been standardized

- The special regulations for loose bulk transportation have been completely revised



- Environmentally hazardous substances of classes UN 3077 and 3082 are fully exempted from the ADR, with the exception of general packaging regulations, if they are held in containers with a maximum content of five liters or kilograms
- The prohibition on smoking in Chapters 8.3.5 and 8.5 is amended to include electronic cigarettes and similar devices

At the same time marine shipment of dangerous goods including radioactive materials (Class 7) has been updated via **IMDG2014**. The previous version of the regulations has been updated primarily to bring them into line the changes to the IAEA Regulations for the Safe Transport of Radioactive Material, SSR-6, 2012 Edition. There are specifically changes to Part 6 of IMDG, particularly to the provisions for packaging's for class 7 (chapter 6.4)

Other key changes to the IMDG include:

- There is a new section setting out conditions when specified types of lamp are exempt from the IMDG Code's provisions
- There is a new paragraph 1.1.2.3 referencing the International Convention for Safe Containers, 1972, as amended.
- Number of changes to the classification provisions in Part 2, including changes to PSNs for several class entries
- For marine pollutants there is a new 2.10.2.7 which provides conditional exemptions from the majority of the IMDG Code's provisions
- There are numerous updates to the Dangerous Goods List in 3.2 including the addition of 20 new UN Numbers from UN 3507 to UN 3526
- Also in the Dangerous Goods List, Column 16 is now split into columns 16a and 16b and stowage and



segregation requirements are now coded, stowage and handling codes in 16a; segregation codes in 16b. This has resulted in a number of changes to Part 7 to reflect the new columns (16a and 16b)

- There are new explanatory notes in 7.1.5, 7.1.6 and 7.2.8 respectively for the stowage (SW), handling (H) and segregation codes (SG) which now appearing in columns 16a and 16b
- There are many revisions to the packing instructions, including those for IBCs and large packaging's and a number of new packing instructions: P208, P505, P805, P908, P909, LP903, LP904
- Clarifications on the design and dimensions of various package marks, labels and placards have been provided including the 'marine pollutant' and 'limited quantity' markings
- There are some changes to documentation requirements in Chapter 5.4 e.g. clarification of the requirements for 'marine pollutant' endorsements
- In chapter 6.6, 'large salvage packagings' has been added
- There is a new segregation requirement in 7.2.4. Flammable gases (class 2.1) and flammable liquids

(class 3) must now be 'separated from' substances which, in contact with water, emit flammable gases (class 4.3)

- There is also a new segregation requirement provided by SG26 which states 'In addition: from goods of classes 2.1 and 3 when stowed on deck of a containership a minimum distance of two container spaces athwartship (ie. in a direction at right angles to the fore-and-aft line of the vessel) shall be maintained, when stowed on ro-ro ships a distance of 6 m athwartship shall be maintained.'. This applies to almost all class 4.3s (including sub-risks) and also covers metal powders and peroxides etc. in other classes

L2 provide Dangerous Goods Safety Adviser (DGSA) to a number of our clients for Class 7 radioactive materials and will be working with them to ensure where appropriate the relevant changes are incorporated into client's management systems, guidance and practices. If you have any specific questions on radioactive material transport or if you would like a discuss L2 being appointed as your DGSA or RAM Transport training then please get in touch.



Learning From Experience - Radiography Incidents

During 2014 there were two significant prosecutions successfully made by HSE relating to industrial radiography accidents that occurred within shielded enclosures.

One related to the use of an X-ray set and the other to a radioactive source. Both accidents resulted in person(s) receiving significant overexposures to extremities.

Both court cases have been reported by HSE on their website and details can be found within the Media Centre/ Press Releases under the months of March and September 2014 (<http://press.hse.gov.uk/release-type/press/>). In addition, additional information can be found within the HSE Radiation Communities webpage which is an essential communication tool for those involved in work with ionising radiation.

Incident 1

The X-ray accident occurred when a radiographer was setting up an exposure inside a shielded enclosure whilst at the same time a colleague was set to work outside the enclosure using the control console of the installed X-ray set to test suspected malfunctioning portable radiation warning beacons which are used for site radiography work. The radiographer setting up the radiograph was holding the X-ray head when the colleague testing a beacon pressed the X-ray on button. The X-ray set energised and at that time the radiographer had the ends of the fingers on his right hand directly over the output port of the X-ray beam. The radiographer noticed a red "radiation on" warning light linked into the installed gamma alarm come on and left the bay immediately.

An immediate investigation was not carried out and matters only came to light when some three weeks later the radiographer informed his employer that a radiation burn had developed on the ends of his fingers. The company carried out a dose reconstruction exercise and estimated that the exposure to the radiographer's fingers was in the region of 20 Sv.

A number of lessons to be learned were identified including:

- Carry out a suitable and sufficient risk assessment for all work activities. In this case there was none for the beacon testing which was a new activity and should have had a prior risk assessment carried out.
- Ensure that a safe system of work and local rules are in

place covering all radiation work activities. In this case there was none for the beacon testing.

- Control of keys to X-ray sets and radiography source containers ie devices which can give rise to significant exposure. In this case the key to the X-ray console was left in position instead of being removed to prevent an exposure.
- Restriction of exposure – employers must take all necessary steps to ensure that radiation doses to their employees are as low as reasonably practicable ie ALARP.

Incident 2

The radioactive source accident occurred when the source capsule became detached from its holder and was lost out of the end of the guide tube being used. The source ended up inside the component being tested and was not detected by both the safety features of the radiography enclosure (installed gamma alarm) or by the radiographer in charge of the work using a radiation monitor.

The loss of the radioactive source was discovered when operatives working on the component, at the next stage of manufacture, spotted a small engineered 'object' and removed it for examination, passing it amongst themselves. The accident was identified when the radiographer returned for the next shift and confirmed the 'object' as a radioactive source.

The subsequent investigation found the workers' hand exposure to radiation was significantly in excess of the annual permitted dose of 500 mSv.

A number of lessons to be learned were identified including:

- Carrying out a suitable and sufficient risk assessment for all work activities. The risk assessment did not identify the loss of the source from the guide tube.
- Undertake monitoring using a suitable radiation monitor. In this case the capability of the monitoring equipment was not well understood and failed to detect where the radioactive source was at all times which is an essential requirement when carrying out radiography work.

- Ensure that a safe system of work and local rules are in place. In this case the procedures were inadequate.
- Restriction of exposure – employers must take all necessary steps to ensure that radiation doses to their employees are as low as reasonably practicable ie ALARP.
- Training, instruction and information must be given to all persons involved in the radiation work. In this case deficiencies in training led to the employer failing to ensure that robust and effective controls were in place to manage the risk of using high activity radioactive sources.

The above accidents could easily have been prevented and radiation exposures could have been much higher. As can be seen from the lessons to be learned there were a number of common factors involved in both events. However, a key

failing associated with both was not carrying out a suitable and sufficient risk assessment. A suitable and sufficient risk assessment must be carried out:

- By involving members of the workforce who have relevant knowledge and experience in the work being carried out
- By using a robust process that identifies all significant hazards likely to be encountered during normal operations and identifies all reasonably foreseeable accident scenarios
- By identifying safe systems of work to followed and ensuring that persons are trained, instructed and informed in carrying them out.

It should never be thought that a risk assessment is just a paperwork exercise!

Regulatory Update - CDM2015

The new Construction (Design and Management) Regulations 2015 are planned to come into force on 6 April 2015 and apply to all building and construction projects, regardless of the size, duration and nature of the work.

The main changes from CDM2007 are as follows:

- **Principal Designer** - the replacement of CDM co-ordinator (under CDM 2007) by Principal Designer means that the responsibility for coordination of the pre-construction phase which is crucial to the management of any successful construction project. This will include planning, managing, monitoring and coordination of all pre-construction phase health and safety.
- **Client** - the new Regulations recognise the influence and importance of the client as the head of the supply chain and as the party best placed to set standards throughout a project, there is an overall strengthening of client duties in CDM2015.
- **Competence** – the new regulations splits ‘competence’ into its component parts of skills, knowledge, training and experience, and - if they are an organisation - organisational capability, provides clarity for the



industry to assess and demonstrate that construction project teams have the right attributes to deliver a healthy and safe project.

- The **technical standards** set out in Part 4 remain essentially unchanged from CDM 2007 and HSE’s has stated that this targeting and enforcement policy, as a proportionate and modern regulator remain unchanged.

There are also a number of other changes such as notification criteria (now only required for projects lasting more than 30 days and involving more than 20 workers simultaneously) who now notifies the HSE. Principal Designer and Principal Contractor will be required on all projects where there will be more than one contractor working on the project.

The new proposed Regulations and supporting guidance (L153) have all been made available in draft form before they come into force and may be subject to further changes. When CDM 2015 comes into force on 6 April 2015, there will be a transitional period that will run for six months from 6 April 2015 to 6 October 2015. If the CDM Co-ordinator has already been

appointed, a Principal Designer must be appointed to replace the CDM Co-ordinator by 6 October 2015, unless the project comes to an end before then. In the period it takes to appoint the Principal Designer, the appointed CDM Co-ordinator should comply with the duties contained in Schedule 4 to the new CDM 2015 Regulations. These duties reflect the existing requirements under CDM 2007 for the CDM Co-ordinator rather than requiring CDM Co-ordinators to act as Principal Designers, a role for which they may not be competent to undertake.

Alongside the HSE draft guidance, CITB via the Construction Industry Advisory Committee (CONIAC)

has produced draft guidance on the roles and responsibilities of all the key role holders.

L2's consultants have significant experience in providing advice on regulatory compliance across a range of hazards and industries. Our team has decades of practical experience and advice to help support clients and manage their health and safety needs in a cost effective manner. Please get in touch if you could like more information on CDM Regulations, Management System Development, CHAS/Safecontractor Accreditation Support or general safety advice.



Radiation Protection Safety Culture

The Society of Radiological Protection (SRP) has recently set up a Working Group to examine the factors which influence Radiological Protection Safety Culture in the workplace.

L2 is an affiliate member of SRP and is a member of this Working Group. A brief overview of the key elements of a good safety culture which should achieve a reduction in exposures is given below and represents the current thinking. It is widely accepted that a strong safety culture is fundamental for minimising dose to as low as reasonably practicable (ALARP) and limiting the potential for a radiation accident. Safety Culture is at the root of everyone behaviours in the workplace. A good safety culture in a organisation will lead to all employees striving to adopt high standards of safe behaviours and prevent harm.

However, achieving this is not an easy task as the 'pressures' of business are often perceived to compete with the desire to achieve high levels of safety. Yet it has been demonstrated by top performing companies that the same priorities and behaviours inherent in a good safety culture also support high quality operations and overall performance.

- Radiological Protection Safety Culture is effectively a sub-set of the wider safety culture and some of the key characteristics of a Strong Safety Culture are:
- Everyone is personally responsible for safety
- Leaders demonstrate commitment to safety
- Trust permeates the organisation
- Decision-making reflects safety first particularly with a conservative approach
- A questioning attitude is encouraged with the confidence to challenge potentially unsafe acts/ conditions/ behaviours and decisions at all levels within an organisation from top to bottom
- A no blame approach is taken to reporting incidents
- Organisational learning is embraced
- Employee involvement at all levels is key to improving safety
- Safety performance is constantly examined
- Good operational performance

From its studies SRP have identified four common factors which can limit the development of a strong safety culture within a company. These are:

Knowledge of Radiation Risks and Impact

Knowledge and understanding of the real radiation risks relative to their benefits are critical. A significant improvement in awareness and technical knowledge would greatly assist the development of a strong safety culture. The lack of proper understanding of radiation risks is major hurdle to establishing an effective RP culture. However, the knowledge needs to be matched to the role of each individual eg. Director, Manager, Supervisor, Worker etc. Several of these key roles are not always identified in current training programmes. It is important to identify the key roles involved, the knowledge requirements for each role and how that knowledge can be effectively imparted.

The role of the Radiation Protection Adviser (RPA)

A key central player in developing and embedding a strong Radiological Protection Safety Culture is the RPA. However, this is a role which is not well understood in many sectors. Amongst Radiological Protection Specialists it is clear that the role is intended to assist the employer to optimise radiation dose and to maintain compliance with the law. However, seen from the perspective of an employer who is under pressure to deliver difficult goals, it can appear that the role is about creating hurdles to getting the job done simply and effectively.

The role of the Radiation Protection Supervisor (RPS)

The RPS is usually a front line Supervisor responsible for the day to day supervision and radiological safety of radiation workers and has a crucial role in developing and maintaining a strong Safety Culture. However, the workload of this group is often high with competing pressures on time and priorities, which can result in operational priorities taking precedence over control and optimisation of avoidable dose. It is important that support is given to RPSs by employers eg to enable the sharing of experience and good practice and assist the implementation of simple ways to minimise dose without affecting operational delivery.

Learning from Experience (LfE)

The development of a learning organisation is one major attribute of a good culture. Without it mistakes will be repeated. Effective Operational Experience Feedback (OEF) is critical but can be difficult to achieve. In some environments this is particularly challenging, with local sensitivities over releasing information for wider sharing and learning and even a perceived risk of prosecution. Efforts are necessary to encourage the widest and most effective sharing of all relevant learning.

The SRP Working Group has proposed the implementation of the following simple measures to improve the above findings as a way forward.

1. RPAs and RPSs to become champions of change within an organisation to seek support from all levels in a company for Safety Culture improvement.
2. RPAs and RPSs to seek support from Employers to engage with employees to emphasise the benefits of a strong Safety Culture and to seek their support in direct involvement and participation in a programme of continuous improvement.
3. RPAs and RPSs to assess the current level of Safety Culture within their company by use of established questionnaires.
4. RPAs and RPSs to engage with the Employer to develop Learning by establishing Operation Experience Feedback (OEF) systems.
5. RPAs and RPSs to encourage the establishment of links with other companies and others to share knowledge and experience on Safety culture improvement.

6. RPAs and RPSs to identify what additional support and skills will enable them to deliver their roles most effectively and avoid the perception of erecting hurdles to effective project delivery where these exist. Possible examples include:

- Engaging with professional bodies and organisations to seek support and assistance to initiate safety

culture improvement

- Benefits in improving soft skills such as communication, persuasion, challenge and where/how these can be acquired
- Understanding what is involved in becoming a learning organisation and the specifics of OEF.

Learning from Experience – RAM Transport

During 2013/14, L2 has increased its audit and inspection activities to our clients who transport radioactive materials and radioactive wastes, including undertaking detailed audits/inspections identifying gap analysis against regulatory requirements and Office of Nuclear Regulation (ONR) guidance via our role as appointed Dangerous Goods Safety Advisers (DGSA).

We have identified a number of common failures from this work which has mirrored by the inspections undertaken by ONR, these are summarised below (in no particular order of priority):

- Incomplete or Incorrectly completed Consignment Notes
- Lack of testing of Emergency/Contingency arrangements
- Security awareness and training
- DGSA appointments including production of Annual Reports
- Vehicle crew carrying appropriate Photo ID
- Inadequate Management Systems and procedures for RAM transport
- Appropriate Training Programme

- Appropriate Radiation Protection Programme
- Inadequate emergency arrangements
- Incorrect Package Labelling
- No Copies of Statutory Instruments/ADR
- Incorrect or absence of Fire Extinguishers
- Poor or Missing Written Instructions for vehicle crew in event of emergency
- In correct contact details for incident reporting to ONR
- Lack of Package Design Approval
- Inadequate radiation / contamination monitoring

If you are interested on advice relating to transport of radioactive materials or training and want to speak to one of our Dangerous Goods Safety Advisers (DGSA) then please get in touch via 0191 213 1407 or sales@l2businessconsulting.com.





Change to HSE Notification for Site Radiography

As you are probably aware the Health & Safety Executive (HSE) has been reviewing the way the site radiography industry is inspected and a new approach has been developed which targets companies suspected of being poor performers.

As part of the review HSE also looked at the 7 day notification of site radiography jobs. The result is that the 7 day notification system remains at least whilst the current regulations remain in place.

In order to update the method of working the way organisations notify HSE has been changed. This will still be web based and will require you to provide less information. Companies who have submitted 7 day notifications in the past will be invited to join a web based community. Once you have joined the community you will be able to notify us of your work 7

days in advance or apply for a waiver.

Guidance is available on issues surrounding the new system. Invitations to join the community were sent out from September 2014 and the new system went live on 1st October 2014. After that date notification for site radiography will only be via the HSE community site (<http://webcommunities.hse.gov.uk/connect.ti>).

If you have any queries on this then please contact one of L2's Radiation Protection Adviser (RPA's) who will be happy to explain the changes and how to adopt the new system.

Where you can see us next

UKTI Civil Nuclear Energy Showcase 2015

Exhibiting and Attending

London 27th – 29th January 2015

Nuclear Institute Hitch Hikers Guide to Nuclear

Speaking and Dinner

Stillington 12th February 2015

LLWR Low Level Waste Forum

Exhibiting and Attending

Penrith 29th April 2015

L2 Key Offerings

REGULATORY ADVISORY SERVICES



Nuclear

- Nuclear Site Licensing/ Environmental Permitting
- Safety & Environmental Prospectus/Nuclear Baseline
- Management Systems
- Independent Peer Review

Radiological Protection

- RPA/RWA Services
- Design Services including Shielding Calculations
- Emergency Preparedness & Contingency Plans
- Training
- Transport Advice including DGSA

Assurance

- Development of Safety, Environmental & Quality Management Systems
- Safety Culture Assessment
- SQEP & Competency Systems
- Audit & Incident Investigation

DECOMMISSIONING AND WASTE MANAGEMENT



Liabilities Assessment

- Funded Decommissioning Programmes (FDP)
- Integrated Waste Strategy (IWS)
- Independent Peer Review
- Benchmarking

Waste Management

- Sampling & Characterisation Plans
- Waste Retrieval & Treatment Studies
- Waste Packaging, Storage & Disposal Studies
- RWMD Letter of Compliance (LoC)

Decommissioning & Demolition

- D&D Studies
- Contaminated Land
- Technology Assessment
- Decontamination & Remediation Strategies

MANAGEMENT ADVISORY SERVICES



Strategic Development

- Market Positioning
- Business Intelligence
- Teaming and Alliancing

Business Winning

- Market Assessment
- Capture Management
- Proposal Strategy

Business Transformation

- Change Management
- Organisational Development
- Interim Management

For more information on how L2 can support you please contact us at:

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