RISK & PREVENTION

BULLETIN OF THE NUCLEAR PROTECTION EVALUATION CENTRE

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EDITORIAL

During the recent years, the function and mission of the Radiation Protection Qualified Expert (PCR) have noticeably evolved. They now cover the evaluation of doses received by workers, the check of protective measures, information about occurring radiological incidents, their analysis, the definition of resources required in case of abnormal situation, the implementation and coordination of preventive measures, the training of exposed workers, etc. Conducting all these tasks may sometimes be difficult in certain facilities, especially in the industrial or medical sectors, and all the more when the PCR is alone within a facility, which is often the case.

It thus appears necessary to implement procedures intended for promoting the release of information and experience sharing among PCR's. In this respect, it is important to highlight the efforts provided by the Qualified Experts Section of the French Society for Radiation Protection (SFRP) which, in particular, organizes every two years, PCR meetings at national level. It is also mentionning the creation of more or less formalized regional networks (including for instance, the Greater-West Regional Network of PCR and Radiation Protection Actors), to promote exchanges and contacts at a territorial level.

The Feature in this issue, which introduces the RELIR network, is in line with the actions that may be taken in order to tighten the links between PCR's and improve their training, based on a shared experience feedback. This network, created in 2001, is an original experiment of involvement by radiation protection actors, from varied activity sectors, in a joint process for collecting, analyzing, and releasing practical experiences. ■

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FEATURE

THE RELIR NETWORK
EXPERIENCE FEEDBACK ABOUT RADIATION INCIDENTS

One of the processes considered by the radiation protection professionals as being most efficient to improve protection and thereby reduce the number and severity of radiation incidents and accidents, certainly consists in releasing and sharing the experience feedback among all actors involved (facility managers, industrial physicians, skilled people, exposed or non exposed workers, etc.). In particular, the analysis of circumstances for incidents that occurred recently, the lessons that may be learnt, both for prevention and protection, and for work organization allow to better prevent such events. Furthermore, applying this experience feedback during the awareness and training sessions for the concerned workers, is essential.

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As from 1998, during a seminar of the European ALARA Network (EAN), the representatives of the United Kingdom radiological protection authorities introduced the system for compiling and analyzing the radiological incident experience feedback they were using: The IRID (Ionising Radiation Incident Database) database. All participants considered that it would be useful developing the same type of systems in other European countries.

In France, such a system called "RELIR" for "Retour d'Expérience sur Les Incidents Radiologiques" (experience feedback on radiological incidents) was created in 2001 at the initiative of the SFRP (French Society for Radiation Protection) PCR Group, in collaboration with INRS (French national research and safety institute), IRSN (French institute for radiological protection and nuclear safety), the Curie Institute, INSTN (French national institute for nuclear science and technology), and CEPN (nuclear protection and evaluation centre).

NETWORK PURPOSES

The basic purposes of the RELIR network are the following:

- Train the professionals concerned, in order to prevent new incidents;
- Produce training aids to be used during initial or on-the-job training sessions for workers;
- Promote information exchanges among radiation protection specialists and non-specialists.

The RELIR network aims at collecting information about so-called "model" incidents or accidents in the industrial, medical and research sectors (it is therefore concerning non nuclear industry sectors). The purpose is not to generate an exhaustive listing of incidents, but to select the events being most interesting in workers' training and incident prevention. Therefore, any incident, regardless of the severity and consequences, may be selected whenever it allows enhancing the experience feedback.

It should be reminded that in the terminology of the RELIR system, the term *"incident"* means *"any situation, event, series of events, behavior, anomaly… likely to generate (or having actually generated) an uncontrolled occupational exposure or a contamination".*

OPERATING PROCEDURES

RELIR is primarily a network of radiation protection actors having a joint interest in sharing the experience feedback, in order to improve the protection of workers, within the facilities where they operate, and more generally, in their activity sectors: medical and veterinarian, industrial, research and education sectors using radioactive material sources, transport, etc. Each sector is represented by one or more moderators, who are collectively in charge of analyzing incidents.

When an individual witnesses an incident or is involved in the incident (qualified expert, employee, industrial physician, etc.), he or she can contact the moderator of the relevant sector. This process is fully independent from the legal reporting to the relevant authorities and do not replace it.

The moderator, a radiation protection expert, then completes a standard questionnaire concerning the incident, jointly with the reporting individual. This questionnaire describes the incident: it allows identifying and analyzing the causes and consequences. A blank questionnaire may be directly downloaded from the RELIR Web site (http://relir.cepn.asso.fr/) or obtained upon request from the INRS or from the system administrator, CEPN.

Among the various reported incidents, the moderators jointly select the most interesting cases, based on their educational value, and generate information sheets that provide an anonymous description of each selected incident and the lessons that may be learnt. Upon completion of this step, the sheets are posted on the RELIR Web site; they are also available on request from the INRS and CEPN. At present, about fifty information sheets are posted. The target audience basically includes exposed workers, instructors and radiation protection actors.

CONFIDENTIALITY AND TRANSPARENCY COMMITMENT

All the moderators and participants in the RELIR network signed a "Confidentiality Charter" through which they undertake not to disclose nominative information about the individuals, the companies, or even the equipment concerned. They also undertake not to use the information provided to them for commercial, advertising or defamatory purposes.

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INFORMATION SHEET FORMAT

All sheets are structured in the same way. They describe the circumstances of the incident, the radiological consequences (potential or actual), and set up a list of lessons to be learnt and recommendations.

The sheet distribution among the various sectors is quite uneven (see table). The most completed sectors are the industrial (10 sheets) sectors and the medical and veterinarian activities (19 sheets).

Most information sheets that are currently fed to the RELIR network are based on the moderators' knowledge and experience feedback, or are extracted from the IRSN, Curie Institute, or Fire Department Radiological Rescue Mobile Squads (CMIR). Practically, it proved quite difficult to spur the employees in the companies, including the radiation protection qualified experts, operating in a competitive environment, to report the occurrence of radiological incidents to the RELIR network.

Nevertheless, the RELIR network is aware of the requirement to permanently enhance and update its database, in order to meet the changing technology and practices. It therefore tries to promote the incident feedback and has implemented new partnerships with various radiation protection professional associations.

RECENT DEVELOPMENTS

In 2006 and 2007, contacts were thus established or tightened with the Association of Radiation Protection Qualified Experts of the Paris Public Hospital Organization and the network of Greater-West Radiation Protection Qualified Experts. It was especially proposed that the RELIR network should be used as a training tool by these professionals and that they undertake to feed the database in case a new type of incident would be reported to them.

The RELIR network was also demanded in 2006 by the SFRP/COFREND (French Confederation for Non Destructive Tests) working group, which was created upon the ASN request, to gather all parties interested in the non destructive test activity, in order to propose radiation protection improvement solutions in this sector. Non destructive testing indeed remains a sector involving the highest occupational exposures and incident risks. The working group covered all aspects of this activity, from the equipment design to the change in regulation and the training of individuals. As the organizer of the RELIR network, the CEPN is in charge of coordinating a sub-group on the experience feedback analysis. The work of this sub-group allowed validating the interest of the RELIR database and performing a critical review of the contents in the non destructive testing sector. The experience of the working group members then allowed creating four additional information sheets that describe new types of incidents. The sub-group, subsequently relayed by the whole SFRP/COFREND working group, recommended the COFREND to use the RELIR system in order to structure the experience feedback and the release of good practices in the non destructive testing sector. The COFREND should thus appoint a moderator.

Like for this cooperation, contacts between professional associations and the RELIR network might allow maintaining the database up to date (by providing new information sheets if a new type of incident occurs) and qualifying the pertinence and representative character of incidents listed in the database. They would be a way to ensure the interest of the sheets and their usefulness during training sessions.

CURRENT USAGE

The RELIR system is referenced by various French sites: IRSN, French National Union of Private Veterinarians, Rennes University, for instance) and foreign sites (IRID or Radiation Oncology Safety Information System, for instance. In France, the database information sheets are used for numerous specific educational activities (APAVE training, Radiation Protection Master, medical and veterinarian training, INSTN qualified expert training, etc.): All these application evidence their educational quality.

Furthermore, every month, about one hundred different visitors view several thousands of pages on the RELIR site (i.e. several tenths of pages opened by each visitor), which evidences the interest of a relatively wide audience in this type of tool.

OUTLOOK

Today, the RELIR system has demonstrated its usefulness in France, for a large number of radiation protection professionals. However, it is important to continue leading the moderator network as well as enhancing and updating the database.

At the national level, the working groups with the radiation protection professional associations will continue.

Furthermore, it should be noted that in July 2007, the ASN published a guide about the significant event reporting procedures in the radiation protection sector, outside basic nuclear facilities and radioactive material transport[1]. Until June 2007, the criteria applicable to radiological incident reports in the non-nuclear sectors - medical, industrial

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and research activities - were not indeed clearly defined. At present, the ASN guide extends to these sectors the reporting principles with regard to significant events involving safety, radiation protection, or environment, already applicable to the basic nuclear facilities and radioactive material transport sectors.

The publication of this guide and the simultaneous development of a database that will allow in time an exhaustive listing by IRSN of the incidents and accidents, will result in a better knowledge of events. These actions are conducive to the development of the RELIR network, which can be enhanced with the reported incidents. In this respect, new cooperation methods between ASN, IRSN and RELIR are currently being studied out.

At the international level, an official cooperation between RELIR and the IRIDS (a database similar to RELIR in the United Kingdom) was recently implemented in order for both systems to share their experience feedback. Also, the RELIR database will soon be enhanced with cards published by the European ALARA network, which describe incidents that occurred in various European countries. ■

[1] *ASN/DEU/03 Guide describing the reporting procedures and coding of significant event related criteria in the radiation protection sector, outside Basic Nuclear Facilities and Radioactive Material Transports*

LIST OF MODERATORS

If you have been informed of an incident, you can contact the moderator of the relevant sector.

SECTORS AND SUB-TOPICS	COORDINATES OF MODERATORS	
Industrial Sector		
Non-destructive testing, Gauges, Small sealed sources	Frédéric Bosle	04 78 90 29 15
Industrial pharmacy	Michaël Kelly	05 53 28 89 09
Medical and Veterinarian Sectors		
Conventional and interventional radiology, Dentistry	Gilles Boirie Jean-Luc Rehel	01 40 87 53 55 01 58 35 80 02
Radiotherapy	Christian Barret	01 42 17 62 94
Nuclear medicine	Chantal Guérin Stéphane Payen Alexandre Jozsa	01 44 49 55 28 01 42 17 62 91 01 49 81 27 86
Veterinarian medicine	Catherine Roy	06 70 29 22 25
Research & Education Sectors		
Education (universities, colleges), Crystallography	Claude Hervieu	02 23 23 67 63
Public research	Michaël Kelly	05 53 28 89 09
Industrial research	Claire Lotte	01 48 68 90 86
Veterinarian research	Catherine Roy	06 70 29 22 25
Transport Sector	Christine Gauron	01 40 44 31 85
Others		
Post-incident response (emergency preparedness), lost sources	Denis Giordan	03 89 60 69 01

You can also contact a "multi-role" moderator.
If in doubt, or if the relevant sector moderator is absent, contact:
Dr Christine Gauron (IRSN): 01 40 44 31 85

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RELIR INFORMATION SHEET TITLE

SECTORS AND SUB-TOPICS	TITLE
Industrial Sector	
Safety inspections	Exposure due to a mobile radioscopy equipment
Non-destructive testing	Incident during a welding inspection
	Incident during a source transfer
	Incident during re-entry of a source
	Incident during an uncontrolled source release
	Radiological test for correct operation check of a generator
	Incidents due to a defective beaconing
	Incomplete evacuation of the exclusion area during non destructive tests
	Incident during a training session
Electron beams	Ionizing treatment facility
	Irradiation of all three individuals in a ionizing treatment facility
Gauges	Textile process plant
	Contamination incident in an agribusiness plant
Medical and Veterinarian Sectors	
Curietherapy	Loss of a #1 iridium wire
	Loss of a #2 iridium wire
Drop-off centres and incinerators	Activation of a radioactivity detection beacon
Nuclear medicine	Incident of iodine-131 contaminated liquid effluent dispersal in a hospital centre
	Contamination of a technician by technecium-99
	Iodine-131 contamination through inhalation
	Activation of alarm on a walk-through scanner
	Administration of a therapeutic dose
Conventional radiology	Defective lead protection in a window
	Exposure of an operator during a dorsolumbar X-ray examination
	Scanner in calibration procedure
Radiotherapy	Exposure of an operator to X rays
	Incident on a telecobaltotherapy equipment
	Accidental irradiation in a radiotherapy department
	Accidental exposure during a radiotherapy handling
Research	Technical gallery in the building housing the nuclear medicine and laboratories
Lost sources	Discovery of a radioactive source in a batch of old radiographic equipment
	Loss of an iridium 192 wire in a hospital centre
Veterinarian sector	Incident during a radiation protection inspection in a veterinarian clinic
Research & Education Sectors	
Research	External and surface contamination with carbon-14 in a radioimmunosorbent laboratory
	Phosphorus-32 contamination in a research laboratory
	Sulfur-35 surface contamination in a research laboratory
	Use of thorium in a research centre
	Tritium dispersal incident in a research facility
Education	Americium-241 radioactive contamination in a university laboratory
Crystallography	Adjustment of the X-ray beam on a crystallography equipment
	Accidental exposure during a crystallography handling
Transport Sector	
	Containment breakage of an iodine-131 unsealed source
	Exposure during transport of two cesium-137 sealed sources
	Exposure during transport of two iridium-192 sealed sources
	Contamination of the vehicle floor during transport of radioactive waste
Others	
	Recovery of a lightning arrester
	Identification of the nature of various stones
	Potential exposure in a high energy radiological facility
	Lost radioactive source

RELIR are available at **www.relir.cepn.asso.fr**

NETWORK NEWS

EUROPEAN ALARA NETWORK

11th EAN seminar

The 11th seminar of the European ALARA Network (EAN) was held from April 9 to 11, 2008, in Athens, Greece. The subject was “ALARA and the radioactive waste management”. Conclusions and recommandations from the seminar are under preparation and will be published on the EAN website.

Information: **http://www.eu-alara.net/**

ISOE

The next ISOE European Symposium on occupational exposure management at nuclear facilities, organized by the CEPN, will be held from June 24 to 27, 2008, in Turku (Finland). The agenda is available on the ISOE Website.

Information: **http://www.isoe-network.net/**

EUROPEAN PROJECT

COWAM in Practice - Governance of radioactive waste management

The five interested parties national groups (Spain, France, United Kingdom, Romania and Slovenia) identified the study topics that they would like to develop in their national environment. The methodological support group should thus direct its researches around the following three topics: the affected communities and the sustained development programs of territories; the structure of local communities and development of the local democracy; long-term questions for a sustainable governance of radioactive waste management.

Information: **http://www.cowam.com**

MAIN PUBLICATIONS

ARTICLES

CROUAIL P., SHAW P., DROUET F.

'Experience and new Developments in Implementing ALARA in Occupational, Public and Patient Exposures'- Summary and Recommendations of the 10th European ALARA Network Workshop.

Radioprotection, Vol. 42, N° 2, 2007, pp. 227-234 (A-1027).

LOCHARD J.

Rehabilitation of Living Conditions in Territories Contaminated by the Chernobyl Accident: The ETHOS Project.

Health Physics, Vol. 93, N° 5, 2007, pp. 522-526. (A-1033)

HERIARD DUBREUIL G., LOCHARD J., LE CARDINAL G., OLLAGNON H.

Une démarche de réhabilitation des conditions de vie dans les territoires contaminés par l’accident de Tchernobyl en Biélorussie : le projet ETHOS.

Ethique, technique et démocratie, Academia Bruylant, 2007, pp. 183-191. (A-1032)

LOCHARD J., SCHNEIDER T.

Gestion des rejets et perception du public.

Contrôle, N° 177, Novembre 2007, pp. 102-106. (A-1030)

LOCHARD J.

La robe et le nuage.

Catalogue de l’Exposition "Vous avez dit radioprotection ? Histoires de rayons X, de radioactivité..."

Neo Typo, Besançon, 2007, pp. 17-31. (A-1031)

REPORT

BATAILLE C., BOUCHER A., SCHIEBER C.

Guide méthodologique pour la mise en œuvre de la démarche d’optimisation de la radioprotection au poste de travail : cas de l’exposition externe corps entier.

CEPN-R-305, Février 2008.

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