

# TAKING INTO ACCOUNT HUMAN AND ORGANISATIONAL ASPECTS OF THE REMOTE MONITORING SYSTEM IN RADIATION PROTECTION

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## Introduction

A remote monitoring system is today one of the main ways considered by EDF to progress in the field of radiation protection (RP). The technical principle is relatively simple: a specific technology allows to collect RP data which are transmitted and centralised in a monitoring room. The ambition is, especially during the outage, to monitor two kinds of data: physical data such as the dose rate, the individual dose and video data. In that room, a supervisor receives, analyses these data and acts accordingly.

In the future, this new technical equipment will characterise, transform and impact the job situation, the work of the Health Physics personal who are in charge of the safety and the respect for the RP rules within the work area. It's important to identify, **to analyse all these impacts in order to develop a new equipment which responds to their need and which allows them to be more efficient in their daily job**. In that framework, the Human Factor Group studies the social acceptability of the RMS according to the point of view of the HP personal. The social acceptability study focuses on two major questions: What could be the use and the utility of the RMS for the HP workers (utility dimension)? What are the conditions under which a RMS is perceived as efficient?

These two major questions were investigated and discussed with the HP workers going around four topics of debate:

- The professional need: what are the professional goals which should be purchased with the RMS?
- The impacts of the RMS on the relationship between different professional groups (HP personal and subcontractor workers): do the RMS possibly changes communication, cooperation and coordination at work?
- The main preoccupations which are "anticipated" by HP personal: the side-effect. For example, the video monitoring could suggest an increase of the social control within the workplace which can lead the HP worker to fear a strengthening of their control activity, an intensification of their role of controller to the detriment of their advice activity.
- The attractiveness of the new job expected from the RMS: do the RMS means new interesting professional function?

## Methodology

The debate were organised within focus groups with two kind of population: the HP workers and the HP managers. Representatives of five nuclear power plants took part to the groups in order to collect a large diversity of points of view.

Each group brought together ten persons for four hours of discussion. All the debates were recorded in order to analyse the data in a second time. The discussion were based on a enquiry which proposed only general questions. The main objective of the methodology was to let free workers to express their own need, fears, requirements, points of views.

## First results

First of all, the RMS project is well accepted by the two groups. The RMS is firstly perceived as an equipment which allows the remote transmission of RP data from the work area to a dedicated monitoring room. The use of this new technology is easily perceived as well as the benefit for the HP field. These two dimensions, use and benefit, conduct to general consensus. The audio and video equipment, useful for real time advice to the subcontracting workers, are not spontaneously mentioned.

The main preoccupation expressed at first by the groups concerned the possible intensification of their control activity. They also worried about the perception of the subcontracting worker. The latter could interpret the RMS as a new tool to control, not only the radiological aspects of the workplace, but their individual behaviour, their working method, and the duration of their technical operations. These worries can be easily understood even if it's not the EDF purpose.

The result can be presented bringing back the two main questions addressed by the study:

What could be the use and the utility of the RMS for the HP workers (utility dimension)?

The main usages evoked by the group are the following:

- The real time and radiological monitoring of the plant, the work operation characterised by high level dose rate, the dose rate, the individual dose.
- The detection of abnormal or not foreseen high level dose rate, the detection of drift, leak and worsening situation.
- The RP data collected could help building faster a diagnosis of the operational situation and making faster the right decision.

So, the expected benefit concern two general fields: the efficiency of the RP action but also the image of the RP field.

The efficiency of the RP action can be appreciated according to:

- The benefit in term of reactivity of the RP department: thanks to the detection of the problem or of an abnormal situation, the RP workers would be systematically alerted and therefore be present to bring the needed specific actions, advices, and so on.
- The ability for the RP department to collect faster the RP data, to analyse them in order to face and to act rapidly in case of the setting of radiological alarms.
- The opportunity to reduce collective and individual dose
- The opportunity to develop and reinforce the feedback process, to get new ways of training

The RMS would, in conclusion, allowed in the RP field during the outage, to go from a reactive and punctual approach to a general, preventive and anticipative approach.

The image of the RP department can also be positively reinforced. The RMS is perceived as a way to modernise the RP activity and to reach news challenges and performances. Therefore within the RP field, the RMS represents a new interest, a new source of motivation. From the RP workers and managers points of view, the RMS is very attractive. Outside the RP field, these same ambitions could also modify the social image of the field. The RMS can lead to the valorisation and the acknowledgment of the field.

What are the conditions under which a RMS is perceived as efficient?

Among the social conditions that facilitate the acceptability of the RMS, it's necessary to distinguish between the attractiveness of the RMS and the usage conditions. Obviously, these elements are closely

connected.

The attractiveness of the RMS relies on the new kind of job and mission offered to the workers. The RMS is a way to diversify their activity, to get new responsibilities and space of actions.

The RMS is acceptable, for both group (worker and manager) only if it focuses on real time advice and on the prevention at work.

The main preoccupation concerns the use of cameras and video data. Camera and video data bring a lot of questions: Do the RMS represents a new and systematic tool of control? Do the RMS means new problem detection and an increasing use of sanction practice? Would the RMS be used for repression purpose instead of prevention purpose ? How to get guaranties that the prevention is the only goal?

One other side-effect perceived by the RP workers is to be disconnected from the work area and the subcontracting workers because they should be present in the monitoring room instead of being in the work area. According to them, their build their legitimacy and their acknowledgment being in contact with the subcontracting workers. The challenge will be to organise a work organisation which allows the RP worker to switch between the RMS and their traditional activity during the outage.

They also alert us about the phenomena which is summarize by the idea of "hotline". The monitoring room, depending the access modalities, could evolve in a place where all the needs would be address, what could be a big source of perturbation for the supervisor.

All these preoccupations conduct therefore to the last question : what can be the impact of the RMS?

The RMS calls for a new work organisation in order to define the supervisor job but also to articulate and coordinate the action of the supervisor and the action of the RP worker.

An analysis must be hold in order to address these topics: the need in terms of competences, of personal, and so on. The actions and kind of decision that the supervisor has to take must be define. The work organisation must avoid the phenomena of the specialisation of the monitoring activity: a competence hold by one person creating organisational dependence.

The RMS calls also for a clear communication process to present the use of video. The need is not only a communication which consists in dispatching information to subcontracting worker but a communication process which takes into account the preoccupation of that population, which responds to their questions, which presents their own interest. So before initiating this process, EDF should clearly exposes the goals purchased with the RMS, the rules which define the use of video data, the new eventual support which will be offered to the subcontracting workers. The implementation of camera should be progressive.

In conclusion, the RMS could significantly modify the way of doing RP during an outage. It certainly leads to modify the working practices, the work organisation and potentially the relationship between RP and subcontracting workers. Therefore, theses evolutions must be all taken into account in order to move with the RMS from a stage of project to an organisational success.

### **Perspectives**

Last June some technical experimentation were conducted on a nuclear power plant during an outage. The experimentation was mainly realised to test the material, to regulate technical problem. It was also the occasion to confront RP worker and subcontracting workers to this new technology, this new working tool and to collect the appreciation. These tests are a big step that feed the final decision process.