

Radiological Rollback at Sellafield Site – A Step Change in Contamination Control Culture

1. Introduction

Radiological rollback (RR) is a process of identifying source terms of radiation and/or contamination within existing controlled areas and controlling them at source, allowing the controlled areas to be physically reduced in size. At Sellafield site this has led to creation of supervised areas as it is appropriate to keep conditions under review. A pilot project was carried out in THORP (Thermal Oxide Reprocessing Plant) Receipt & Storage (TR&S) on Sellafield site, as it has few interactions with other plants and was maintained at the lower end of the controlled area contamination and radiation limits (<0.4Bq/cm² alpha, <4.0Bq/cm² beta total contamination, <0.04Bq/cm² alpha and <0.4Bq/cm² beta loose contamination and radiation <2.5μSv/h gamma).



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An initial feasibility study was undertaken to determine if RR was possible within TR&S and define the scope of work required to implement the change. Significant industrial relations issues were raised by the workforce but as dialogue continued and understanding of the process grew, this eased and these key influencers are now keen for RR to be extended to other buildings.



2. Main Text

The pilot radiological rollback (RR) project on Sellafield site was undertaken in THORP Receipt & Storage. The process is similar to one used by URS at the Savannah River Site in South Carolina, USA.

Each issue from the feasibility study was addressed and the solutions gathered into a program of work. Reviews have driven improved working practices and ensured all the radiological requirements are aligned. The changes were ~10% physical modifications, ~10% procedural changes and the remaining 80% was associated with individuals' attitudes and behaviours. The program was completed in late November 2010, allowing the plant's readiness to be assessed and transition to occur on 12th December 2010. Since then the plant and project team have been working through the teething issues with the change to many years of custom and practice on Sellafield site. In reality it was just the end of the beginning for RR.

Most of the benefits of RR are intangible but a few are measurable; reduced transit time to access the supervised area being the easiest. The largest time saving is for individuals who before RR would change into factory clothing and now do not. There is a generic saving as there is no need to change footwear on entering the building. Assuming individuals enter the supervised area at least three times a day even a small time saving adds up, considering the total number of people accessing the supervised area daily.

The greatest benefit observed from RR is the change in contamination control culture observed. There is an increased level of reporting of contamination events, improved standard of self frisking and reporting of lower level contamination events than previously. This is partly due to a cultural shift as personnel are allowed to wear their personal clothing in the supervised area without a lab coat (required in the controlled area). The workforce perception is the building must be kept cleaner, as there is potential for individuals to take contamination off the plant if it is present in the supervised area, due to the lack of footwear change. There has been a conscious change to keeping contamination within the remaining controlled areas whereas previously low level contamination (<0.04Bq/cm² beta) was tolerated.

3. Conclusion

RR is a process which improves contamination control by identifying sources of radiation and contamination within existing controlled area, allowing it to be reduced in size. There are further benefits in the changes in contamination control culture and easier plant access.

RR has been shared with other plants on the Sellafield site and a number of new build projects (such as Sellafield Product & Residue Store) are now supervised areas rather than controlled areas as the site design standard has been modified. Three further plants on Sellafield site have carried out their own RR in 2011/12.

One of these was THORP main building which is linked to TR&S and shares many resources with TR&S. This project has similar issues with TR&S and the opportunity has been taken to extend the scope of RR to include new lower Health Physics monitoring action levels. This is challenging as the levels our procedures detail are beyond the scope of the instruments used. Therefore a compromise was required to satisfy the requirement to use a lower level in a supervised area than a controlled area and take into account the background.



Fig 1: TR&S link bridge prior to RR



Fig 2: TR&S link bridge post RR transition

SUMMARY

In summary, a volume of 300,000m³ has been re-designated as supervised area from controlled area. The project has moved to a second, much larger & more populated building.