

RADIOLOGICAL PROTECTION & OUTAGE MANAGEMENT

ACTING TOGETHER TO REDUCE NUCLEAR COSTS



Introduction

- For nuclear sites the hierarchy of objectives remain safety, quality and cost. In other words cost can be a consideration once a given safety & quality performance is achieved.
- The purpose of this presentation is to consider how RP may be able to contribute to cost reduction.
- As an example, in recent history North American utilities have recorded considerable financial savings, where remote monitoring systems have enabled a reduction in RP technician numbers.
- Although Sizewell has deployed similar systems we have not achieved any tangible reduction in cost – instead the remote monitoring has given direct improvements in safety and quality with indirect cost benefits.

Some basic tenets

- Dose = Doserate x time
- Collective Dose = Effective RCA doserate x Total RCA-hours
- Reducing either RCA doserate or RCA hours will necessarily reduce the collective dose. Reducing RCA-hours may also reduce costs.
- So efforts by the RP programme to reduce RCA-hours may also realise a cost saving for the utility.

Some further principles

- A finished job will record no more dose.
- Once all jobs are finished then the outage (or a large project) also finishes. Once an outage ends then the cost of contractors, utility staff overtime and lost electricity generation will end.
- So fundamentally the goals of Radiological Protection, Outage Management and Finance are completely aligned.

Example of outage costs (Sizewell B)

Lost electricity generation costs

- £1.15M per outage day (£50,000 per hour)

Typical outage contract costs

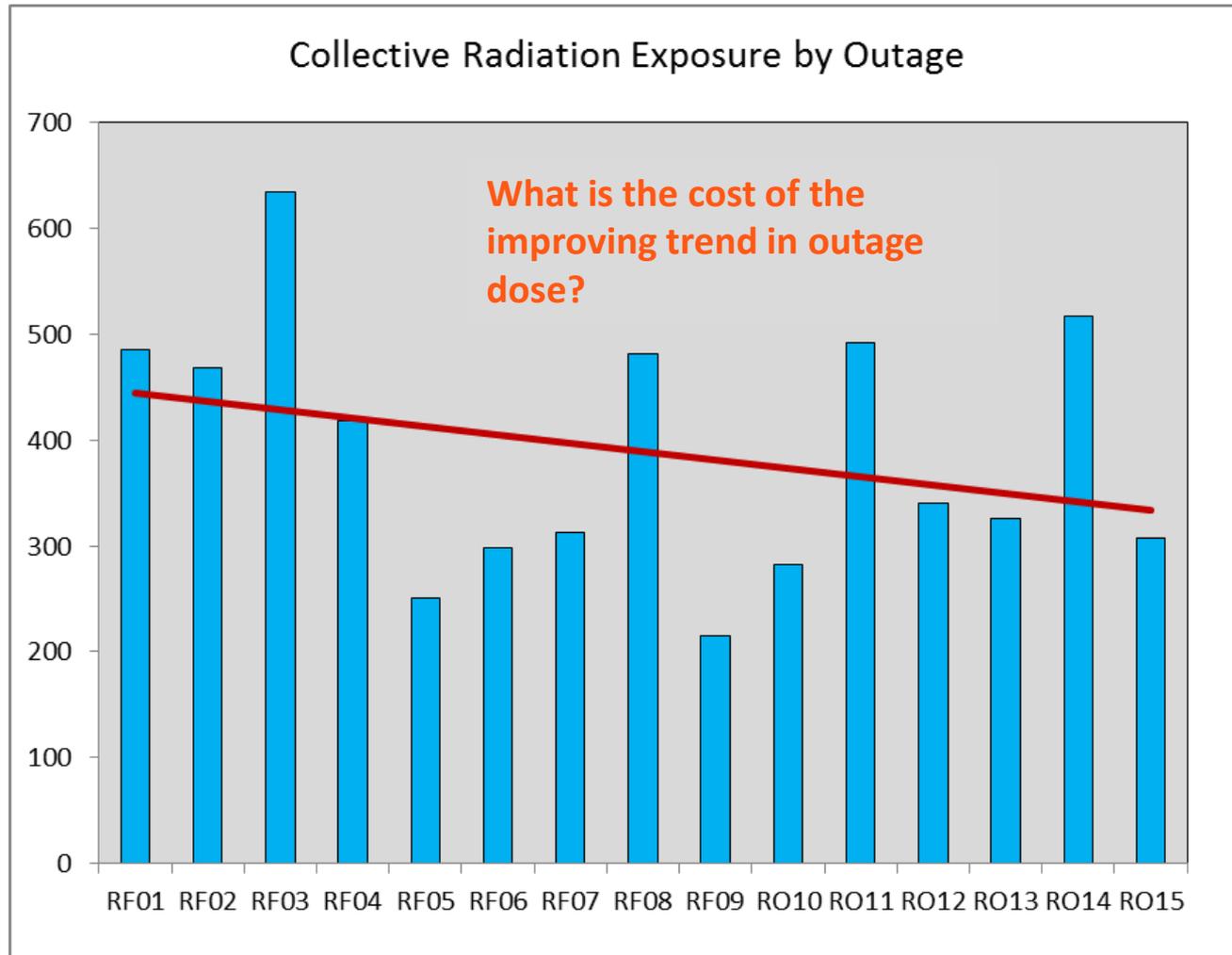
- £35M (£350 per hour)

Typical RP contract costs

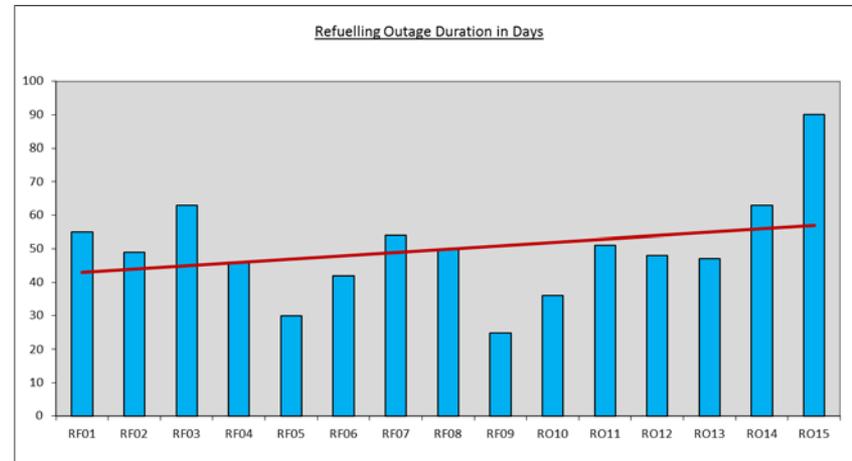
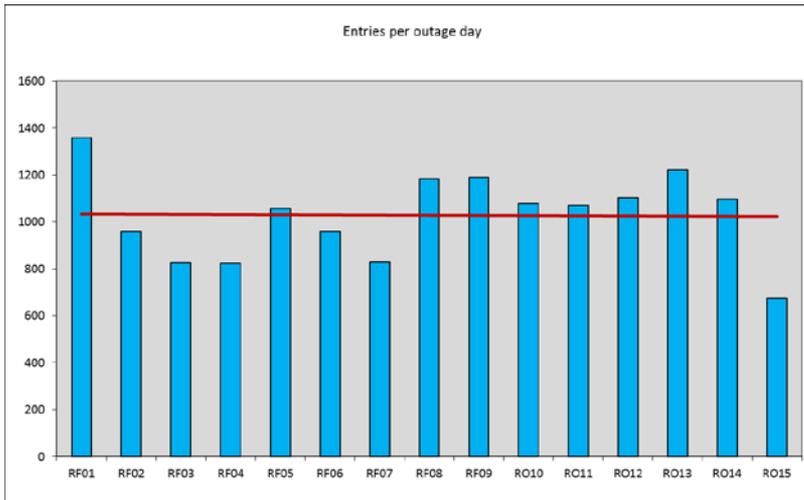
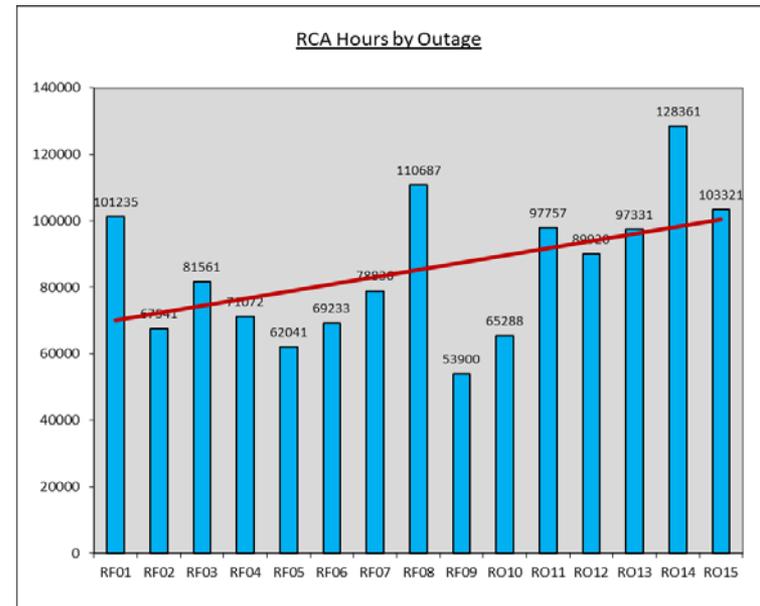
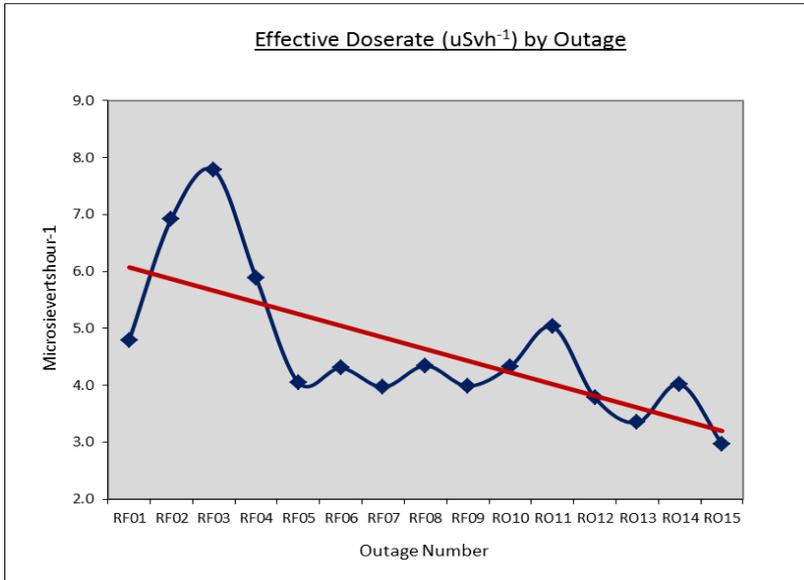
- £1M (£10 per RCA-hour)*

*total RCA-hours not just RCA-hours worked by RP

Evolution of Outage Collective Radiation Exposure



Evolution of Outage duration and effective dose rate



How can RP support indirect cost reduction?

- Work preparation
 - Act as a champion for strong work preparation.
 - Challenge work scope (engineering knowledge in RP?)
- Early integration of RP controls
 - Ensure RP requirements are reflected in plans – e.g. shielding, tents, decontamination activities. Avoid jobs stopping in the field due to unanticipated RP requirements.
- Consistent application of RP standards
 - Applying broadly consistent standards of optimisation across all work packages.

How can RP support indirect cost reduction?

- A service-driven RP organisation
 - Recognition that RP is a service as well as a safety function. By pragmatically supporting the completion of work, tasks can be efficiently finished therefore recording no more dose. However does this pragmatic approach align with the expectations of our RP Fundamentals?
- Use of a strong “Lessons Learned” (OPEX) process to improve all of the above.

Some concluding thoughts

- Orthodox thinking is that RP is an added cost since RP will inevitably cause work to progress slower.
- However by championing high quality work preparation RP promotes efficient work execution, avoids mishaps and re-work.
- So indirectly the RP Manager has the same goal as the Outage Manager and the Finance Manager – short, well-executed outages will tend to deliver low doses.
- Therefore RP is an integral part of safe, cost-efficient outages. A wise Outage Manager will recognise a high-performing RP function as a catalyst for success.

THANK YOU

