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MOPDT MODIFICATION SYSTEM: THE ONLY UK COMPANY ABLE TO SELF APPROVE CATEGORY C MODIFICATIONS.

Andrew Barber
Magnox Ltd

Sam Waters
Magnox Ltd

Kathryn Jackson
Magnox Ltd

1. ABSTACT

The Magnox Operating Programme Delivery Team (MOPDT) are responsible for the safe delivery of irradiated fuel from the remaining fuelled Magnox Ltd sites in the UK and the Dounreay site (Scotland) to the Sellafield reprocessing facility. The fuel is transported in a fleet of 42 Type B(M) cuboidal packages referred to as M2 flasks, the transport of which is regulated by the Office of Nuclear Regulation, Radioactive Material Transport (ONR-RMT) referred to in this paper as RMT.

Before December 2010 MOPDT was required to submit all changes to the package design (excluding typographical changes) to the RMT for approval. Since this date the RMT has permitted MOPDT to self approve minor changes to the package and/or package design application not primarily affecting package safety, known as a Category C modification.

Magnox are currently the only UK applicant able to do this.

This paper looks at how this has been achieved using a formal procedure for initiating, assessing and approving modifications structured by a Management Control Procedure (MCP). This ensures any modifications adhere to the requirements set out in the 'Carriage of Dangerous Good and Use of Transportable Pressure Equipment Regulations' and provides a means of compliance with the Department for Transport Guide to an Application for the UK Competent Authority Approval of Radioactive Material in Transport. The modification review committee draws on experienced personnel from other areas of Magnox Ltd as well as transport safety case experience, reviews, challenges and categorises the changes to design. The MCP comprises a suite of forms which ensures the correct information is presented, considered and recorded.

The benefits of this include better sharing of information between Magnox Ltd and RMT, a higher standard of modification submissions, a more structured approach to the completion of submissions and allows the regulator to focus resource on higher priority/category applications and submissions.

Based on the successful implementation process proposals are being drawn to allow self approval of higher category modifications.

2. INTRODUCTION

The Magnox Operating Programme Delivery Team (MOPDT) are responsible for the safe delivery of irradiated fuel from the remaining fuelled Magnox Ltd sites in the UK and the Dounreay site (Scotland) to Sellafield reprocessing facility. The fuel is transported in a fleet of 42 Type B(M) cuboidal packages referred to as M2 flasks, the transport of which is regulated by the Office of Nuclear Regulation, Radioactive Material Transport (ONR-RMT) referred to in this presentation as RMT.

The MOPDT is design authority for the Mk2 flasks. Any change to the package design and or package design application is justified by MOPDT using the modifications process to manage the change. It is important that any modifications are processed efficiently to enable as many of the packages as possible to remain in service. Package unavailability would ultimately limit the amount of reprocessing at Sellafield, and could delay the end-date of reprocessing which has been agreed by the government as part of the OSPAR agreement, to reduce discharge into the Irish sea by 2020. It would also be very costly to continue Magnox fuel reprocessing at Sellafield past the target end-date.

In 2010 MOPDT redesigned their modifications process. This improved process has many benefits for Magnox, the RMT and for the wider industry. Along with other factors the improved Modifications process gave the RMT enough confidence in the system to allow MOPDT to self-approve some classes of Modification. In order to gain this approval the new modification process became a company Management Control Procedure (MCP). There was also a period of shadow working and a review of previous modifications to ensure similar working practices.
This paper will explain the changes made to the Modification system, the benefits it has brought and the plans for future changes.

3. WHY MODIFICATIONS

The Magnox flask fleet moves on average around 8 shipments of fuel per week. As the round trip from sites to Sellafield and back takes around 3 weeks Magnox requires the flasks to be in use all year round. Magnox flasks are always under certification, with certificates renewable typically every five years. Magnox use Modifications to keep the packages continually in certification as opposed to other applicants who may only require certificates for one-off moves.
The fleet of Magnox flasks were manufactured in the 1970s and 1980s. Modifications are sometimes required to update procedures for operations, repairs and maintenance, make changes to safety case documents or spare specifications, which, are outdated and/or could benefit from modern advances.

4. HISTORIC MODIFICATIONS PROCESS

The previous Modification process comprised a short form with five sections: Details of Modification, Safety Implications, Operational Implications, Drawing Combination for Service and Implementation Programme. The proposal was on average about two pages long and would be verified and reviewed by a member of MOPDT and a category suggested before being sent to RMT for review and categorisation. Comments from RMT would be sent to MOPDT to allow for further justification and explanation, or changes to be made to the modification.

5. WHY CHANGE WAS NEEDED

The old process required RMT to review and categorise all modifications. Due to the RMT's demanding work schedule this could take a number of months. There was also limited flexibility in the process: the RMT had a structured programme for all their

work which Magnox work fed into. It was and is difficult to get priorities changed or work done at short notice due to their commitments to other work and organisations.

Within Magnox, MOPDT modifications were only signed onto by member of the MOPDT; successive organisational changes reduced the independence of the functions needed to provide objective support. It was recognised that this could be significantly improved.
Modifications to plant on Nuclear Licenced Sites in the UK are regulated by a different department in the Office for Nuclear regulation (ONR). Site modifications up to a certain category are already self-approved. Changing the approval process for transport Modifications in Magnox means experience and learning from the site process can be used.

6. NEW MODIFICATION PROCESS

The new modification process comprises a modification form and a submission which is significantly more detailed and structured. The modifications are reviewed by members of the MOPDT and following this, by an independent review committee an over view of the process can be seen in Appendix A. There are four key participants in the Modification process:

- The Responsible Engineer (RE) is the technical lead and is responsible for overall detailed progression of the modification and ensuring all technical, engineering, operational safety and regulatory constraints have been considered within the modification. The RE fills out most of the modification form and normally writes the modification submission The RE is an engineer working in the MOP team who has undertaken a specific training plan and interview with the manager of MOP team engineering.
- The Responsible Officer(RO) is lead verifier. They are also required to review and sign onto the modification form and submission, paying particular attention to the technical aspects. The RO is a technical expert who is experienced at writing modifications and has completed a specific training plan.
- The Modification Review Committee (MRC) is a group independent of the MOPDT, responsible for challenging, questioning and categorising the modification. The MRC has been modelled on the Plant Review Committee (PRC) onsite which is a similar well-established set-up for plant modifications. The PRC reviews plant modifications which are regulated by the ONR. Sites have experience of self approving modifications. The individuals on the MRC have experience of site modifications and apply this experience to transport modifications. Before the MRC reviewed modifications they underwent radioactive materials transport and safety case training. These courses were both taught by Safety Case experts in MOPDT.

  The MRC reviews all modifications raised by the MOPDT. The MRC comprises a group of experienced site engineers and technical managers. In order for the meeting to be quorate there must be, a Chair, a Suitably Qualified and Experienced Person (SQEP) representative covering safety case issues, a

SQEP representative covering typical mechanical issues, a technical manager and a member of the MOPDT .
The MRC's purpose is to be an independent challenge to the modification, and each individual pays particular attention to any safety concerns linked to their specialism.

- The Site Director is responsible for either authorising the modification for implementation, or authorising it to be sent to the RMT, depending on the categorisation of the modification.

6.1. The modification form

The form contains the modification proposal and has several hold points to ensure certain steps have been taken before the next stage is completed. The modification form comprises six main sections: Initial modification request and screening, Initial engineering details and MRC assessment, developed details and final categorisation, approval, implementation and closure.

The modifications are categorised using the following descriptions given by RMT.

- Category A
  A major change to the package and/or package design application directly affecting the assessed package safety, ie structural integrity, containment, shielding, heat transfer or criticality.

- Category B
  A significant change to the package and/or package design application not primarily affecting the assessed package safety.

- Category C
  A minor change to the package and/or the package design application not primarily affecting the assessed package safety.

- Category X
  A correction to a drawing or safety document, which is required in order to rectify an indisputable error or omission and for which the required amendment is obvious.

6.2. The modification submission

A submission is required for category A, B and C modifications. This contains all the details and work done for the justification of the modification proposal. It is usually written by the RE and is verified and signed onto by the RO. If the modification is category A or B the submission is signed onto by the Site Director before being sent to the RMT after Stage 4 of the Modifications process. If the submission is accepted the RMT signs the front cover. If the modification is category C the site director does not sign the submission.

7. AGREEMENT FROM ONR-RMT

In order to obtain self-approval agreement from RMT for Category C submissions, MOPDT worked to provide RMT with confidence in the new Modification process. This involved MOPDT working closely with ONR-RMT and MRC in the following areas:

- Flask safety case familiarisation training for MRC members.
- Working in parallel with RMT for a period of time, submitting modifications through the new process whilst they were simultaneously going through the RMT process.
- Presenting new process to RMT.
- Sending minutes of MRC meetings to RMT.

8. BENEFITS OF THE NEW MODIFICATION PROCESS

The new modification process and Category C self-approval has resulted in a number of benefits for the MOP team, the RMT and the wider nuclear industry since December 2010.

8.1. Time savings

Before self-approval Modifications could take a substantially longer time to be approved. Due to the RMT's demanding work schedule and the large number of modifications it could take six months or more from the date of submission for a Modification to be approved by the RMT. This caused issues for work scheduling and ultimately challenged the ability to meet defueling deadlines.
Now that Category C modifications can be approved within Magnox, these Modifications can be turned around on site meaning minimum impact on flask operations.

For example, a recent issue with paint resulted in all flask movements having to be stopped until a category C modification was approved. Our self approval process meant we were able to complete the modification process in minimum time and return our flasks to service. In the past an issue such as this could have meant having to stop flask movements for weeks or months while the Modification was approved by the RMT (dependant on RMT's work schedule).

The RMT deal with all civil nuclear applicants in the UK, and therefore have a demanding programme of work. Between December 2010 and July 2013 there were 25 Category C Modifications without the self-categorisation process these would all have had to be approved by RMT. The reduction in modifications sent to the RMT has freed up time for other higher category work from Magnox and other applicants. The thorough review and challenges that our Category A and B Modifications receive from our MRC and the processes as a whole before they are sent to the RMT also means they are of a better quality and so take less time for the RMT to review.

8.2. Quality of Modifications

The new Modifications process has resulted in a more thorough and structured Modification submission. This along with the challenges from the MRC means the quality of Modifications submitted has improved. These factors are key elements in

making a strong safety case which elicits confidence from RMT. The time taken by the RMT for assessing and commenting on category A and B submissions has been seen to decrease as a result of the improved quality.

9. FUTURE PLANS

MOPDT are now working towards permission to self-approve category B modifications. This will require MOPDT to demonstrate their ability to do so and then obtain agreement from the RMT, in a similar way to the sign-on to category C self approval.

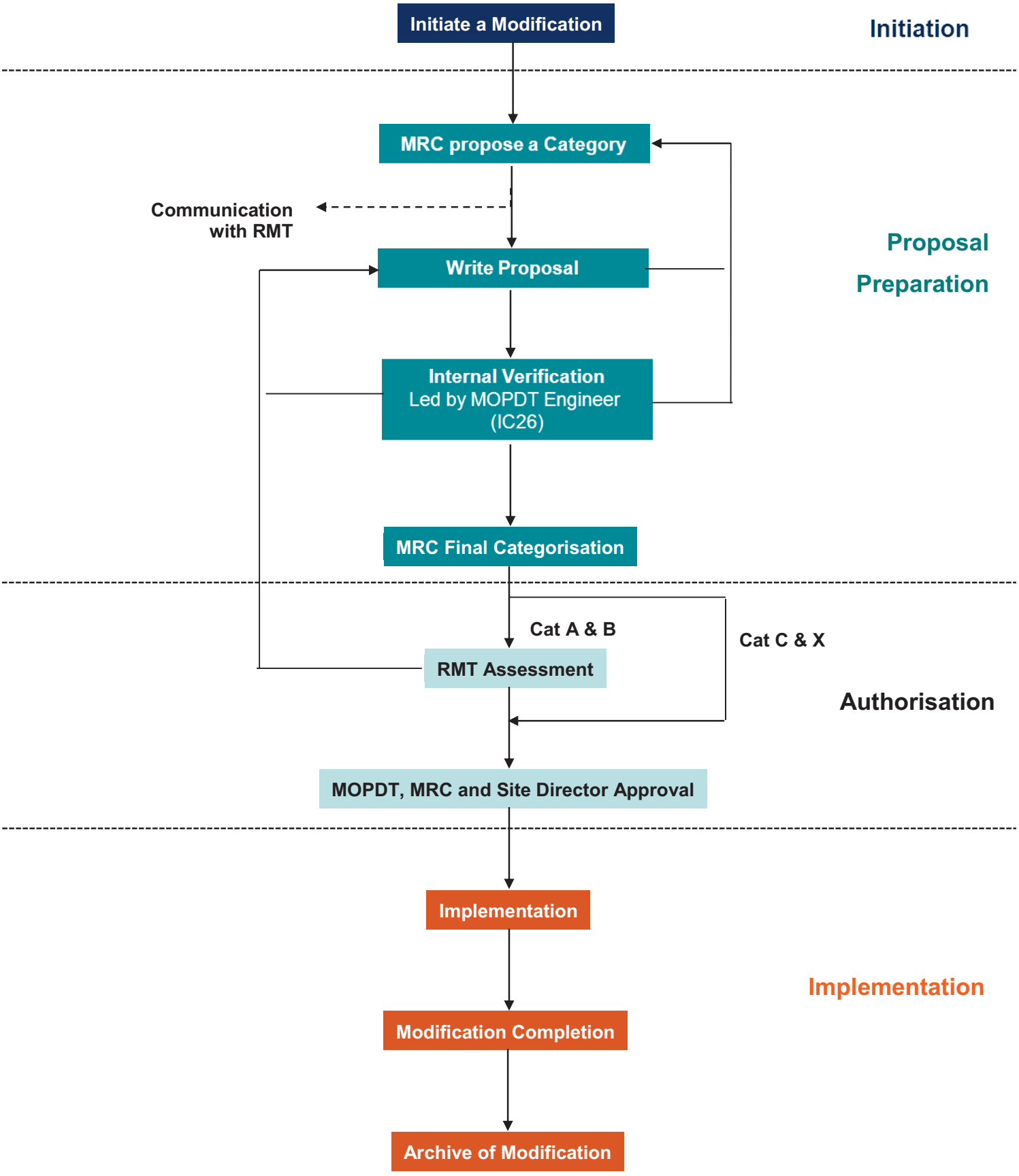
MOPDT propose that any Category B modifications will go through the process as described above, but instead of being sent to the RMT at the end of stage 4 they will be sent to Independent Nuclear Safety Assessment (INSA). INSA is already an established group within Magnox who undertake assessment of category 1 and 2 site modifications. It is made up of experienced subject matter experts.

We are proposing to mirror this already established approach with the off-site flask modifications.

10. CONCLUSION

Of all the benefits achieved by the new modification process the main enhancement has been time saving. It also utilises RMT recourse more effectively than before, and has improved the relationship with the regulator. The structure of the new process, drawing on contributions from relevant subject matter experts, and the associated increased quality of the submissions has contributed to allowing RMT to support national nuclear programmes in the UK.

Appendix A


Initiate a Modification
Initiation
MRC propose a Category
Communication with RMT
Write Proposal
Proposal Preparation
Internal Verification
Led by MOPDT Engineer
(IC26)
MRC Final Categorisation
Cat A & B
Cat C & X
RMT Assessment
Authorisation
MOPDT, MRC and Site Director Approval
Implementation
Implementation
Modification Completion
Archive of Modification