

Identification of Conditions & Limits Necessary in the Interests of Safety – Operating Rules

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Office for Nuclear Regulation

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Presentation overview

- About the Office for Nuclear Regulation
- UK Law ... what is an operating rule?
- Are all operating rules equally important?
- Defence in depth and the double contingency principle
- Criticality safety and operating rules

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About the Office for Nuclear Regulation

- ONR became an agency of the Health and Safety Executive on 01 April 2011
- The new body brings together the regulation of nuclear safety, security, safeguards and the safe transport of radioactive materials
- ONR's mission is securing the protection of people and society from the hazards of the nuclear industry
- Whilst the structure and organisation of nuclear regulation is changing, the responsibilities held and regulatory requirements that duty holders have to comply with remain unchanged
- ONR will build on a strong UK regulatory regime and use the greater freedom it has been granted to meet the current and future challenges of the nuclear sector
- Further information about ONR can be found at:
www.hse.gov.uk/nuclear

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UK Law and the Nuclear Site Licence

- In the UK, nuclear facility operators are subject to the conditions within a nuclear site licence (NSL)
- The NSL is the same for all UK nuclear licensed sites and contains 36 conditions
- This presentation focuses on parts of Licence Condition (LC) 23 and its relevance to criticality safety

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UK law and regulation by ONR

- UK health and safety law places duties on employers to ensure safety so far as is reasonably practicable.
- More commonly this is translated as requiring risks to be As Low As Reasonably Practicable (ALARP)
- ONR Inspectors use published Safety Assessment Principles (SAPs) to guide regulatory decisions
- Technical Assessment Guides (TAGs) provide additional guidance to inspectors
- Guidance is published on the ONR website.
www.hse.gov.uk/nuclear

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What's an Operating Rule?

"prevents the serious operational state in which the Primary Safety Measures have failed to provide protection from the initiating event"

"the conditions and limits which ensure that the plant or process is kept in a safe condition ... defining the safe envelope"



"the set of instructions from [company] to the station manager requiring him to operate the station in accordance with the agreed and accepted safety case ..."

"conditions or limits necessary in the interests of safety"

A set of rules setting forth parameter *limits*, the functional capability and the performance levels of equipment and personnel approved by the *regulatory body* for safe *operation* of an *authorized facility*.

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LC23 Benchmark Process

- Week-long inspections at six UK licensees to compare implementation of LC23
- Survey of international good practice
- Development of guidance
- ONR-wide consultation
- Feedback to Benchmark licensees
- Formal Issue (23 August 2011)

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What does LC23 require?

- Based on a legal reading of what LC23 says an Operating Rule (OR) should be:
 - “conditions and limits necessary in the interests of safety” “identified” from the “adequate safety case”
 - Within which “operations are at all times controlled and carried out in compliance with”

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A possible fault progression ...

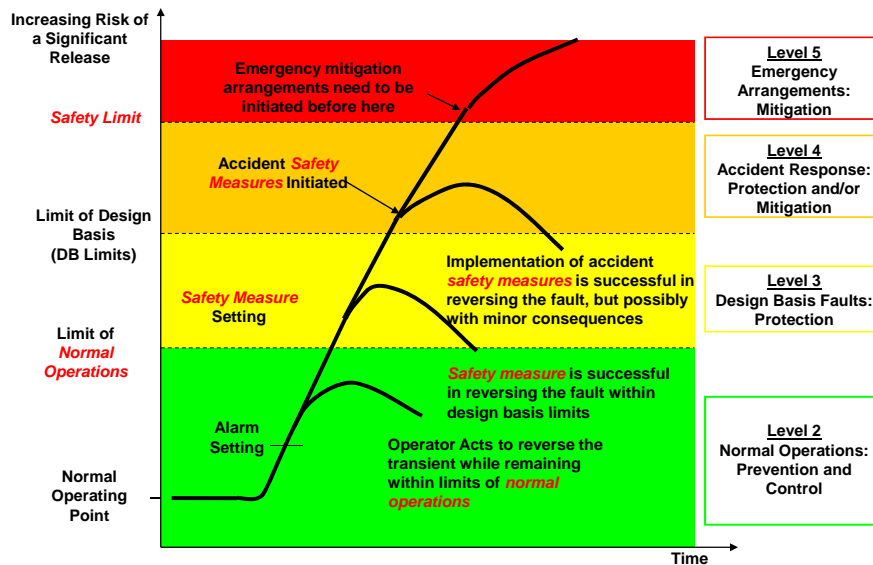


Figure 2: Schematic Illustration of Defence in Depth Approach to Operating Rules

Type of limits and conditions in ORs

- Parametric
- Operational
- Protective
- Time-based
- Theoretical
- Underlying

Are all ORs equally important?

- Obviously not ... the safety case needs to define them all, but some are more important than others ...
- ONR expects a targeted and proportionate (graded) approach in which the greatest attention and care is applied to the identification and implementation of conditions and limits with the greatest importance to safety.
- For example, the consequences of all faults are not all the same ...

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A tiered (targeted) approach – Target 4

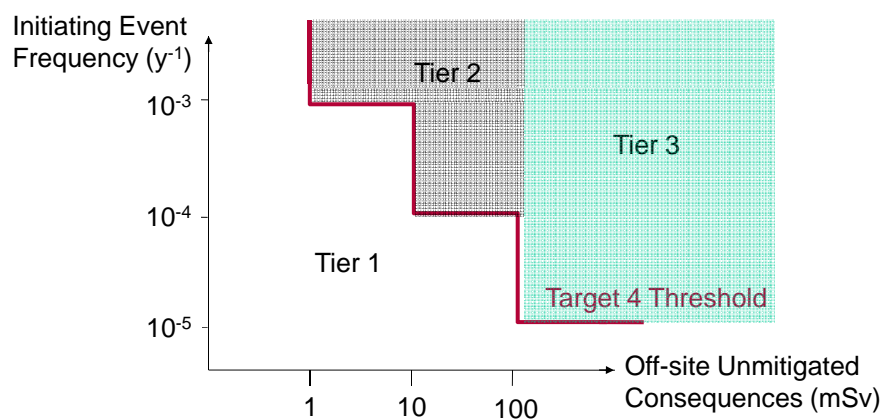


Figure 1a: Operating Rule Tiers for Off-Site Consequences of a Fault

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A tiered (targeted) approach – Target 4

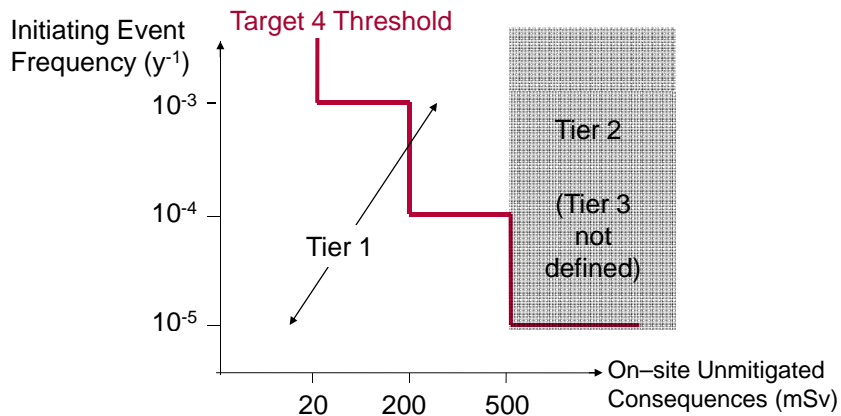


Figure 1b: Operating Rule Tiers for On-Site Consequences of a Fault

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Defence in Depth and the Double Contingency Principle

- In addition to a defence in depth approach, relevant good industry practices should be followed.
- ONR's SAPs states that "A criticality safety case should incorporate the double contingency approach" as this has been accepted relevant good industry practice for criticality safety.
- Overriding requirement is ALARP.

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A possible batch process fault progression ...

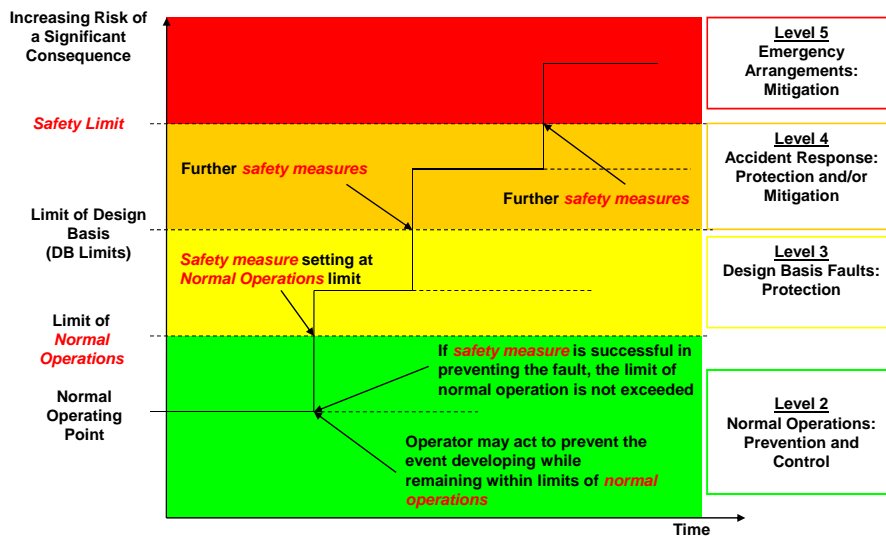


Figure 3: Schematic Illustration of Defence in Depth Approach to Operating Rules for Operations Subject to Step Changes and Preventative Safety Measures

Questions?



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