



**Australian Government**  
**Nuclear Safety Committee**

Reference: R21/04366

21 May 2021

Dr Carl-Magnus Larsson  
Chief Executive Officer  
ARPANSA  
PO Box 655  
Miranda NSW 1490, Australia

**Nuclear Safety Committee**

***Advice to the CEO of ARPANSA***

Dear Dr Larsson

I refer to your letter dated 26 March 2021 requesting the Committee provide you with advice on the matter of the OPAL riser defects – ANSTO’s mitigation & rectification plan.

The NSC advice enclosed has been prepared with support from the ARPANSA Secretariat and is provided for your consideration. Please don’t hesitate to be in touch should you have any questions.

Yours Sincerely,

A handwritten signature in black ink, appearing to read 'Tamie Weaver'.

Dr Tamie Weaver  
Chair of the Nuclear Safety Committee

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an advisory body to the CEO of ARPANSA established under the ARPANSA Act 1998

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## **Advice from the NSC to the CEO of ARPANSA**

### **General information on ANSTO's mitigation and rectification plan**

To obtain a complete and comprehensive understanding of the riser defects, its causes and potential mitigation strategies it is the NSC's advice that detailed information is sought from ANSTO on the following matters:

1. Explanation as to why the structural defects occurred. The explanation should include a report from the original design authority (INVAP) on the OPAL riser defect and any similar problems reported from any other research reactors designed and constructed by INVAP.
2. Confirmation of the original manufacturer equipment qualification and determination of the potential for impact on other parts of the system if there were weaknesses in the qualification process.
3. Determination of the extent of the impacts of pressure transients on the whole cooling system, including support structures.
4. The outcomes from completion of the internal and external riser inspection program, including the identification and measurement of all defects and an assessment of the current impact to the riser condition and other associated safety critical plant.
5. Frequency and scope of the ongoing in-service inspection (ISI) program and the basis for this. ANSTO should investigate in-service inspection experience and practice worldwide of similar types of defects in explaining how it has arrived at its own ISI program.
6. Details of the ongoing internal and external ISI program including clear statements of actions following an ISI inspection and defined trigger levels for immediate actions if a defect is seen to have increased or a new defect is found.
7. How learnings from this event have been included in the updated in-service inspection plan.
8. Urgent mitigative actions that are to be put in place, including the urgency of actions and timelines for when they are to be undertaken.
9. Repair/replacement tasks that are to be completed as soon as practicable based on the safety significance of the findings.
10. Confirmation that any engineered modifications will address the root cause and will not be implemented as a manual "work around" to reduce the safety impact.
11. Confirmation that any engineered modifications will be assessed fully in order that safety functional requirements are not compromised.
12. That capabilities within ANSTO to deal with this matter through to a solution are in place from the point of view of quantitative analysis of fault propagation to engineering design of replacement equipment to rigorous internal quality assurance. This may involve support and assessment by external independent experts.
13. Consideration of potential impacts on the current licensing basis for the facility licence.

The NSC notes that the letter from ANSTO is dated 24 December 2020 and that some matters may already have been addressed by ANSTO and in correspondence between ANSTO and ARPANSA.

**The NSC advises that ARPANSA and ANSTO address the following relating to safety and engineering evaluation:**

1. Assess other areas within the OPAL plant where inspections of the condition of the plant have not yet been carried out particularly within the OPAL reactor and service pools.
2. As part of the reporting from the ISI program establish dialogue between ANSTO and ARPANSA to discuss where the “decision points” are when inspection findings are reported. For example, if there is no change to the defect, the assessed defect has increased, or a new defect has appeared, then what will be the action taken?
3. Identify the points at which specific licence conditions for the facility may be impacted and other licence conditions may be needed.
4. Explore the consequences to overall risk from a range of approaches. The NSC notes that the BDBA Beam Tube LOCA re-assessment has the potential to avoid plant modifications that may have unforeseen safety or risk consequences.
5. Continue to progress options for riser repair and redesign/replacement and mitigative safety features in parallel with the ISI program and regardless of whether the current faults propagate.
6. The flap valves are an important Engineered Safety Feature as they provide reactor core cooling by natural circulation. Any change to the flap valve designs or operational changes to manually assist flap valve closure would need to be assessed as to their safety significance.

**Additional Comments**

It is expected that some of the works will be carried out by contractors. ANSTO, as well as ARPANSA, will need to satisfy themselves as to the competency of contractors to carry out work on any safety related plant.

The NSC further advises that ARPANSA make inquiries with other nuclear regulators who may have experience of these types of faults.