

Marintec & UTS Rapido Hackathon

UTS Tech Festival

Mon 17 June – Tue 18 June 2024





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Rapido

Who are we?

At Navantia Australia, we are committed to growing our local workforce and links to the Australian supply chain to best support the growth of a truly Australian naval shipbuilding and sustainment industry.





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Who are we?

Marintec aims to nurture Australia's sovereign capability in the maritime sector through cutting edge research and development (R&D) in digital technologies.





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Who are we?

Bridging the gap between academia and industry, Rapido is an impact-focused R&D innovation hub embedded within UTS.



Event Schedule

Monday, 17 June (Day 1)

- 10:00 AM – Kick-off, Industry Introductions & Orientation
- N 10:30 AM – Problem Definition
- 11:00 AM – User Experience & Environment
- 12:00 PM – Lunch Break
- 1:00 PM – Team Formation
- R 1:30 PM – Co-design Ideation Session
- R 5:00 PM – End of hosted session

Tuesday, 18 June (Day 2)

- R 10:00 AM – Prototype Development
- 12:00 PM – Lunch Break
- 1:00 PM – Testing & Refinement, Pitch Preparation
- N 3:00 PM – Final Pitches & Award Ceremony
- 5:00 PM – End of session





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The Task

Design and build a system to assist crew on a naval ship in diagnosing and determining actions following alarms from the ship's primary Engine.



Scenario

A crew member on a naval ship encounters one or multiple alarms on the primary engine.

They lack immediate access to an expert or the required technical documentation.

Your system, which has ingested the required documentation and extracted the necessary insights, will provide a diagnosis and recommended actions.



FIL-002/Lube oil duplex filter as indicator filter

The lube oil duplex filter has the function of an indicator filter and must be cleaned manually. It must be installed downstream of the lube oil automatic filter, as close as possible to the engine. The pipe section between filter and engine inlet must be closely inspected before installation. This pipe section must be divided and flanges have to be fitted so that all bends and welding seams can be inspected and cleaned prior to final installation. In case of a two-stage automatic filter, the installation of a duplex filter can be avoided. Customers who want to fulfil a higher safety level, are free to mount an additional duplex filter close to the engine.

The lube oil duplex filter protects the engine also in case of malfunctions of the lube oil automatic filter. The monitoring system of the automatic filter generates an alarm signal to alert the operating personnel. A maintenance of the automatic filter becomes necessary. For this purpose the lube oil flow through the automatic filter has to be stopped. Single-main engine plants may continue to stay in operation by by-passing the automatic filter. Lube oil can still be filtrated sufficiently in this situation by only using the duplex filter.

In multi-engine-plants, where it is not possible to by-pass the lube oil automatic filter without loss of lube oil filtration, the affected engine has to be stopped in this situation.

The design of the lube oil duplex filter must ensure that no parts of the filter can become loose and enter the engine.

The drain connections equipped with shut-off fittings in the two chambers of the lube oil duplex filter returns into the leakage oil collecting tank (T-006). Draining will remove the dirt accumulated in the casing and prevents contamination of the clean oil side of the filter. Please check also table [Arrangement principles for lube oil filters, Page 293](#).

Indication and alarm of filters

The lube oil automatic filter FIL-001 and the lube oil duplex filter FIL-002 are equipped with local visual differential pressure indicators and additionally with differential pressure switches. The switches are used for pre-alarm and main alarm.

Differential pressure between filter inlet and outlet (dp)	Lube oil automatic filter FIL-001		Lube oil duplex filter FIL-002
	Intermittent flushing	Continuous flushing	
dp switch with lower set point is active	This dp switch has to be installed twice if an intermittent flushing filter is used. The first switch is used for the filter control; it will start the automatic flushing procedure. The second switch is adjusted at the identical set point as the first. Once the second switch is activated, and after a time delay of approximately 3 minutes, the dp pre-alarm "filter is polluted" is generated. The time delay becomes necessary to effect the automatic flushing procedure before and to evaluate its effect.		The dp pre-alarm: "Filter is polluted" is generated immediately
dp switch with higher set point is active	The dp main alarm "filter failure" is generated immediately. If the main alarm is still active after 30 min, the engine output power will be reduced automatically.		

Table 159: Indication and alarm of filters







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Tools & Submission

github.com/MarintecGitHub/UTS-Hackathon

Submission is a pitch presentation





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Prizes!!! :)

Overall Winner - \$500

UTS Rapido Future Innovators Award - \$200



UTS Rapido award criteria

As an industry-facing innovation team, UTS Rapido understands the importance of recognising and rewarding industry-ready innovation. To ensure a fair and comprehensive evaluation process, we have outlined the award criteria for the innovation project based on four categories:

1. Excellence in Design and Build

- Clear thought process and design planning behind the initial concept.
- Clearly communicate the objective significance of the design's impact.
- Strong visual design appeal, relevant to the target audience.
- Emphasises functionality and practicality, I.E. assesses whether the design can be realistically implemented given current technology, resources, and constraints. Considers usability and how easily the design can be understood and operated by intended users.

2. Technical Excellence

- Demonstrates proficiency in applying engineering principles and concepts.
- Utilises advanced technologies and techniques relevant to the field.
- Shows a sound understanding of the project's technical challenges and solutions.
- Considers the level of commercial readiness of the built solution.

3. Innovation and Creativity

- Introduces novel ideas or approaches to solve existing problems.
- Demonstrates out-of-the-box thinking and originality.
- Offers unique features or functionalities that differentiate it from existing solutions.

4. Presentation and Communication

- Delivers a clear, concise, and engaging professional-level presentation.
- Effectively communicates the project's objectives, methodologies, and results.
- Utilises appropriate visual aids, diagrams, and demonstrations to enhance understanding and marketability.



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Rules & Limitations

 **Navantia**
Australia



Rules & Limitations

- Teams of 3-5
- Shouldn't be more than 5
- Can be solo, but **not recommended**
- Can ask ChatGPT (& co.) for help, but not to do ALL your work for you...





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How to get help

- Ask us around the room!
- Ask our industry experts!
- Ask each other!

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Let's get started!

