

# **8<sup>th</sup> IAEA DEMO Programme Workshop**

## **30 August – 2 September 2022**

### **Session 3:**

# **Efficiency: coolant selection, cost, and delivery time**

**- Discussion -**

# Discussion prompts

- **Point raised by Chair IAEA:**

**How can the plasma, and plants, deal with transients coming from the “grid” requirements, particularly in regards load following be accommodated?**

**What does this do to the plasma, particularly w.r.t. ramp up and ramp down rates and “dwell/storage options”?**

# Discussion prompts

- **Can we accommodate pulsed (plasma) devices w.r.t. plant systems?**

**If yes, do we have evidence to say this with confidence; and what are the “costs”, and can we accommodate this commercially?**

**If no, should we then shift all DEMO devices to non-pules modes now?**

# Discussion prompts

- **Do the fusion community need to develop electrical power systems and cooling systems (heat exchangers) that are optimised for fusion to make it work, or do we need to “fit” our reactors to existing systems. Why?**

# Discussion prompts

- **Is there a possibility to reduce engineering & construction time for DEMO if we make the “right” choices?**

**How will this impact performance? / efficiency?**

# Discussion prompts

- **How to translate plasma and other fundamental uncertainties into the requirements of power plant design?**

**Some of these will not be solved for all DEMOs until operation. How to accommodate this risk while making progress?**

# Discussion prompts

- How long will it take to realize a “digital twin” for ITER or for DEMO?

Can we build / operate a DEMO without digital twin?

# Discussion prompts

- Do we believe DEMO needs to demonstrate “net power” -  
or just a pathway to net power?
- Do we believe DEMO devices need to have the same coolant loops, and materials sets etc., as commercial systems

**OR**

**are they free to deviate?**

**If free to deviate, are there any reasons to “chase” advanced or optimised cooling system on DEMOs?**