

'Game Changer' of Conventional Submarine

KSS-III Batch-II

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Republic of Korea



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- ◆ Former Career
 - Underwater Force Development Officer, JCS(2013)
 - Commanding Officer, ROKS ChoiMuSeon(Type 209)(2014)
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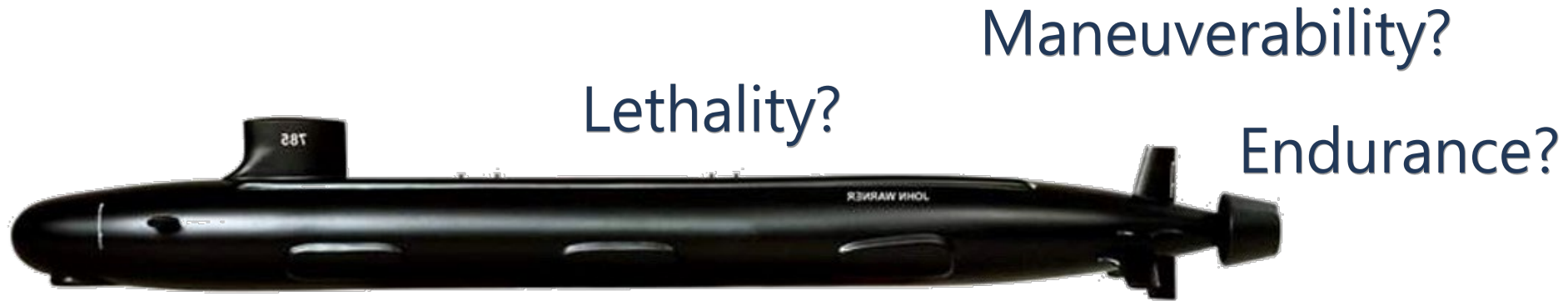
II Game Changer, KSS-III Submarine

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1 Limitations of Conventional Submarine

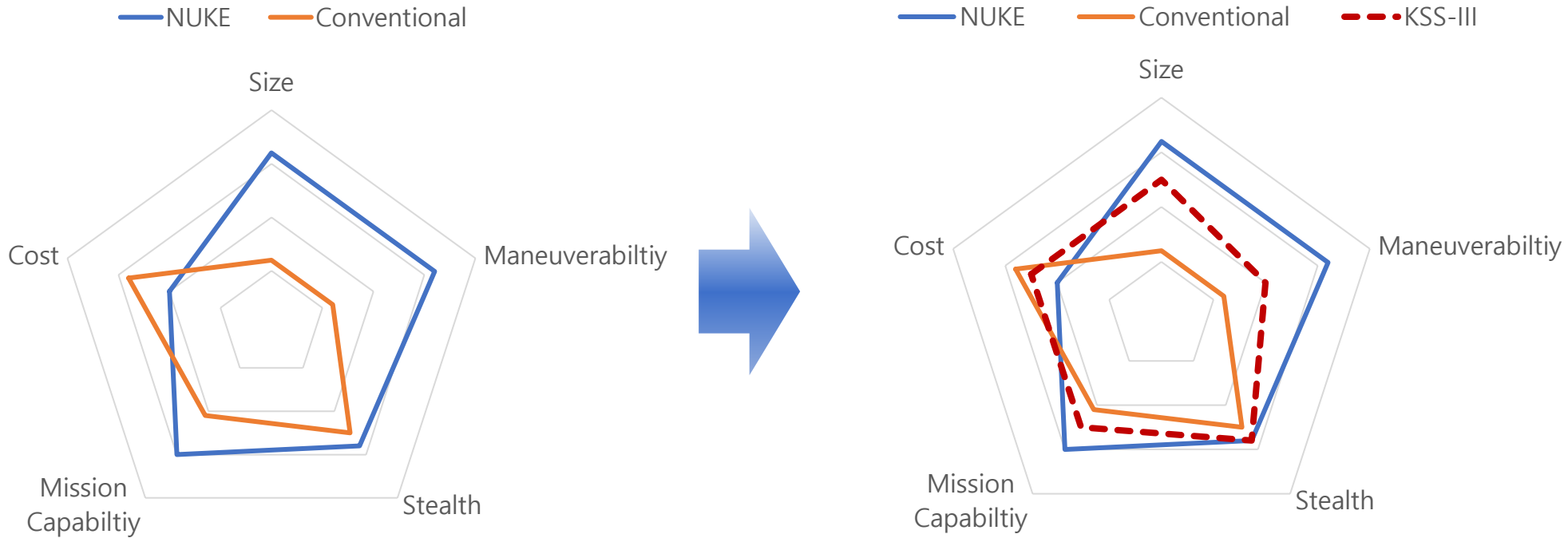


VS



Low Operational Risk?

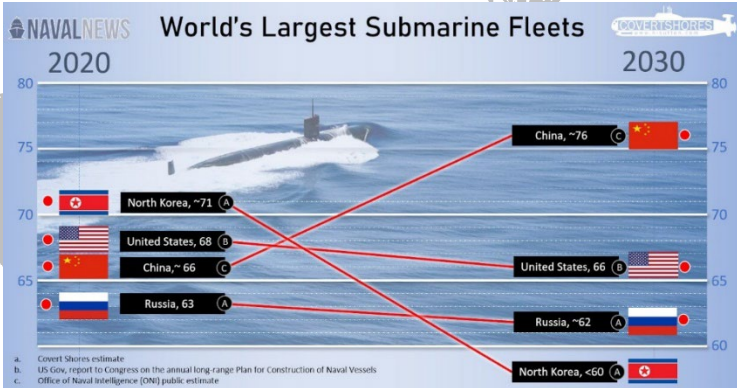
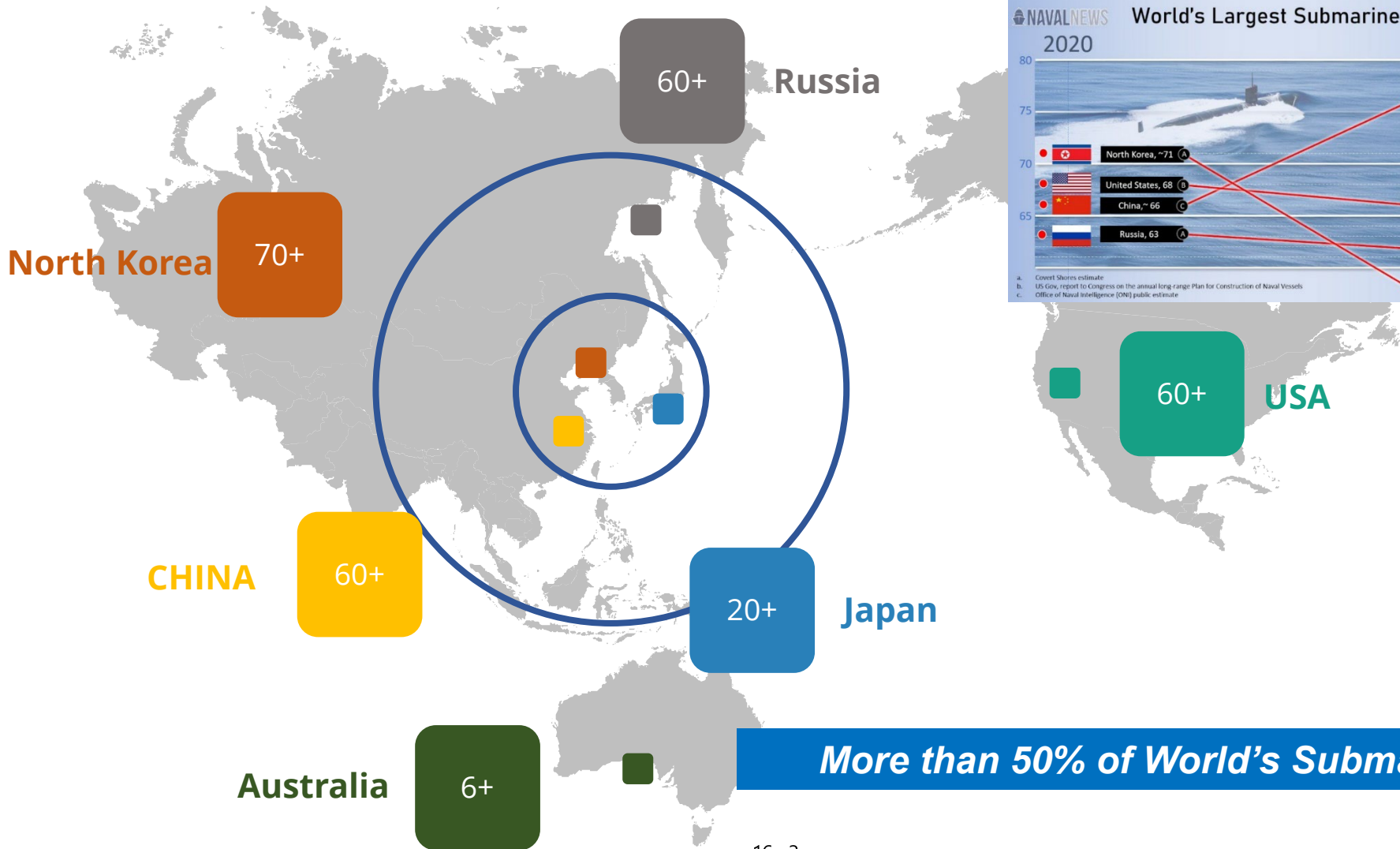
1 Limitations of Conventional Submarine



Mission Capability, Speed, Stealth, Lethality, Cost-Effectiveness

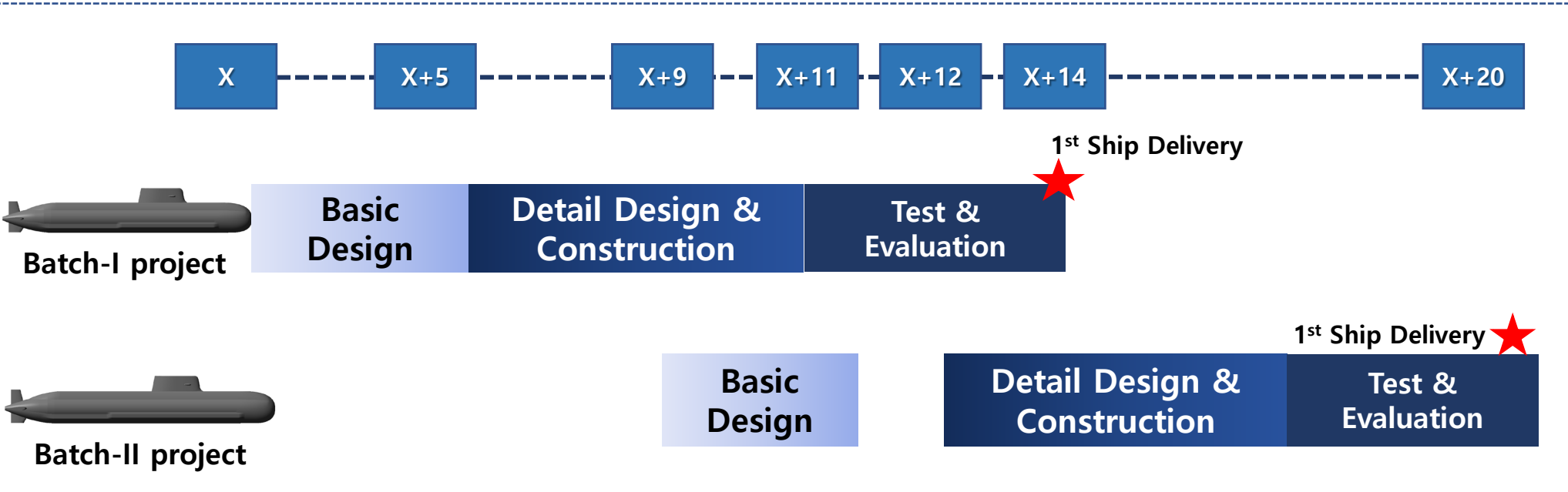
Breakthrough

○ Why? 3,000+ton Conventional Submarine?

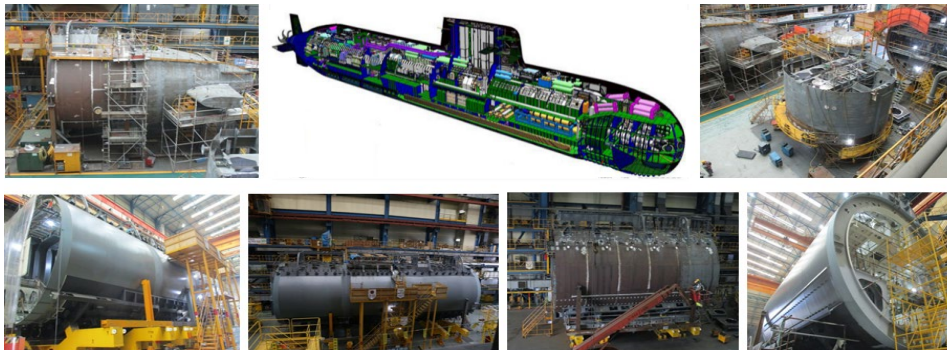
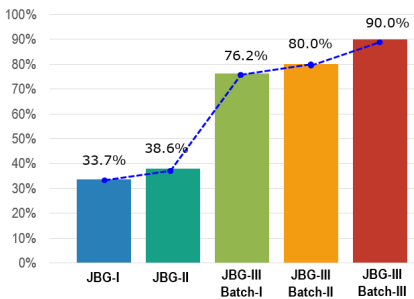


More than 50% of World's Submarines

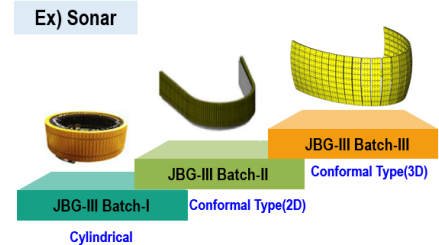
○ Incremental Development

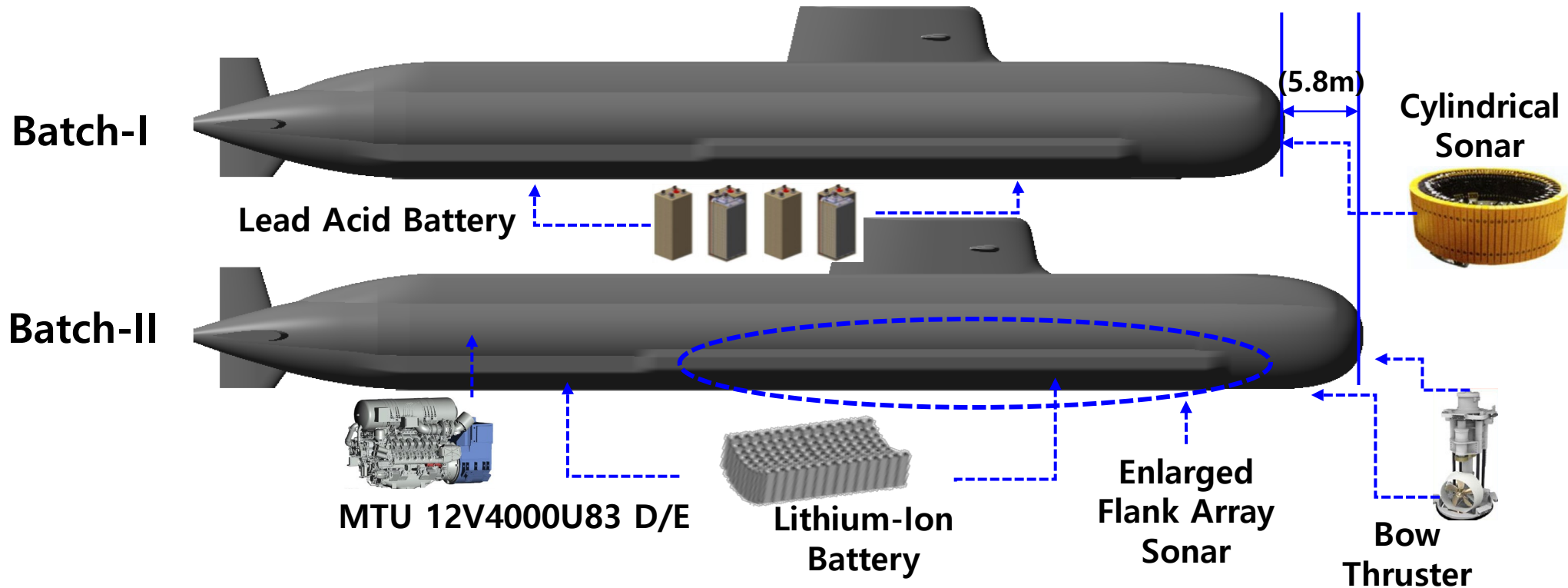


○ Localization plan in a phased approach



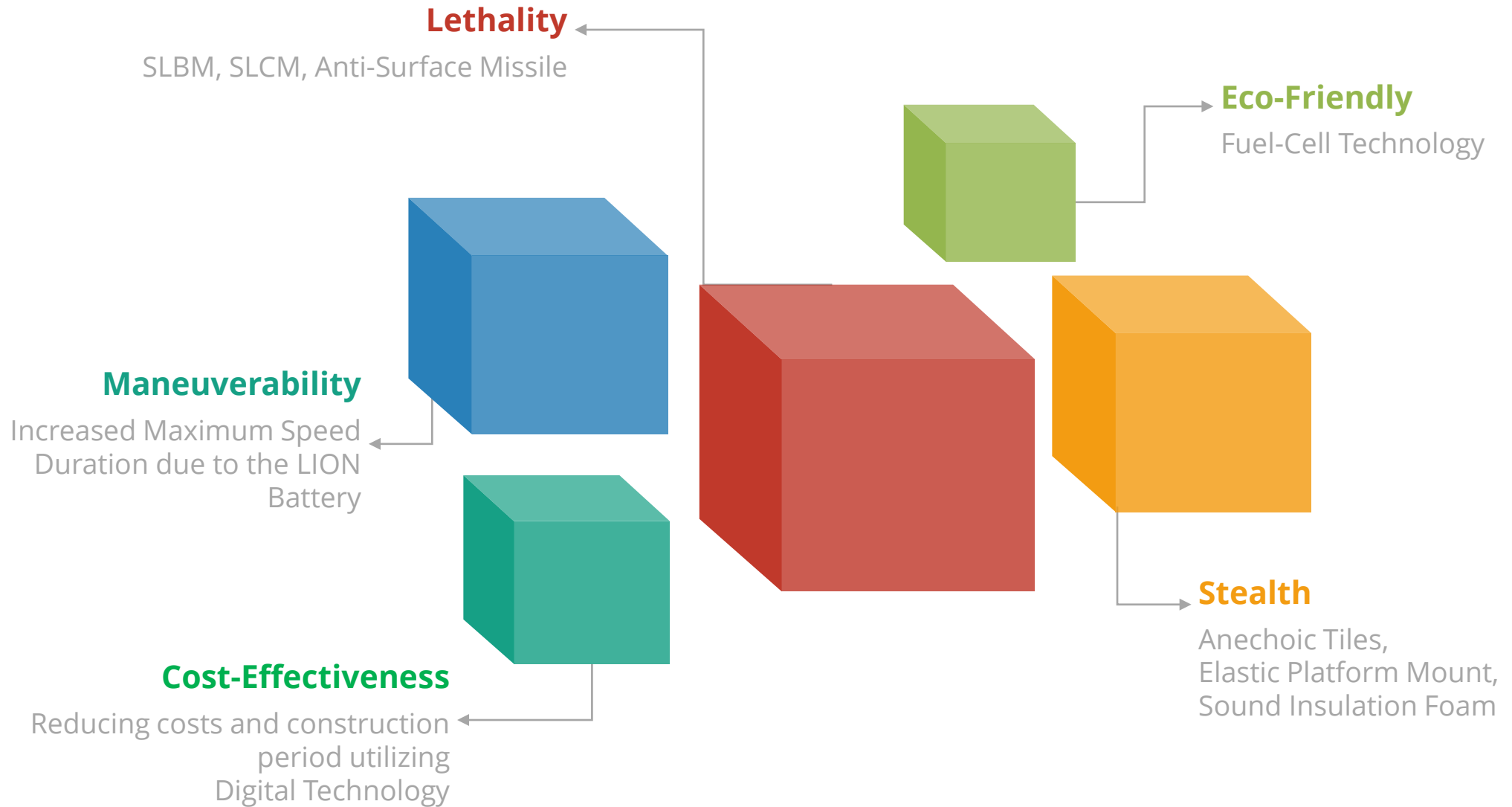
○ Key technology development





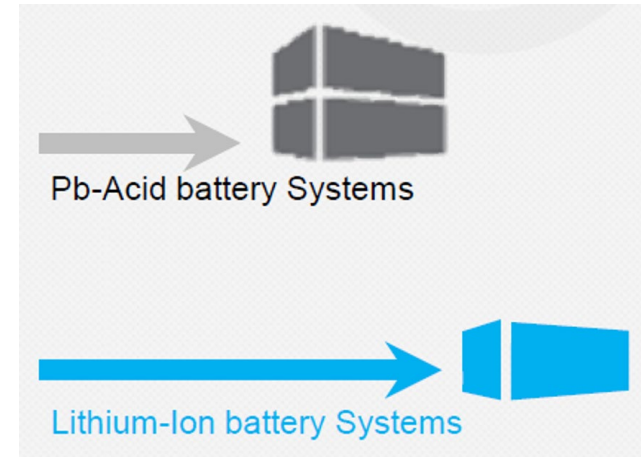
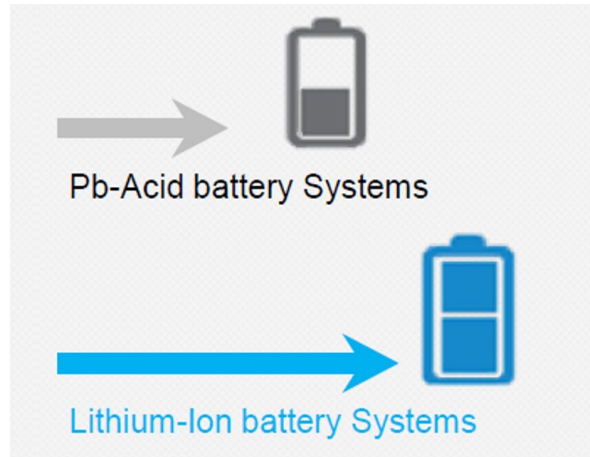
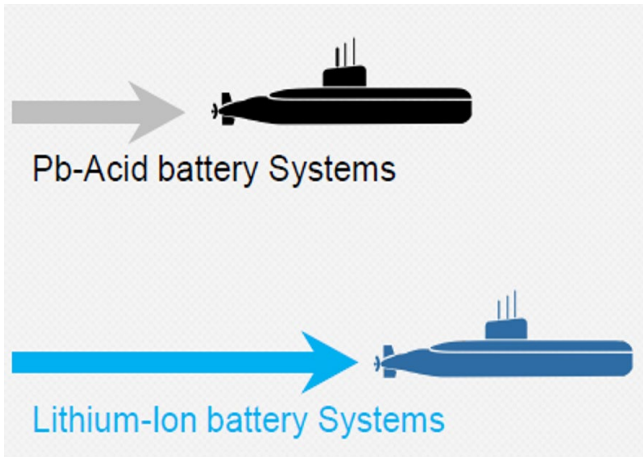
- ✓ **World's Largest Diesel-Electric Submarine**
- ✓ **Less Acoustic Noise Level**
- ✓ **Higher Survivability & Endurance**
- ✓ **Longer Detection Range**
- ✓ **Enhanced Precision Strike Capability**

3 Innovative Technologies



3 Innovative Technologies

○ LION Battery



✓ **Longer Operation Range**

Cruising Speed(160% ↑)

Max. Speed(300% ↑)

✓ **Less Maintenance**

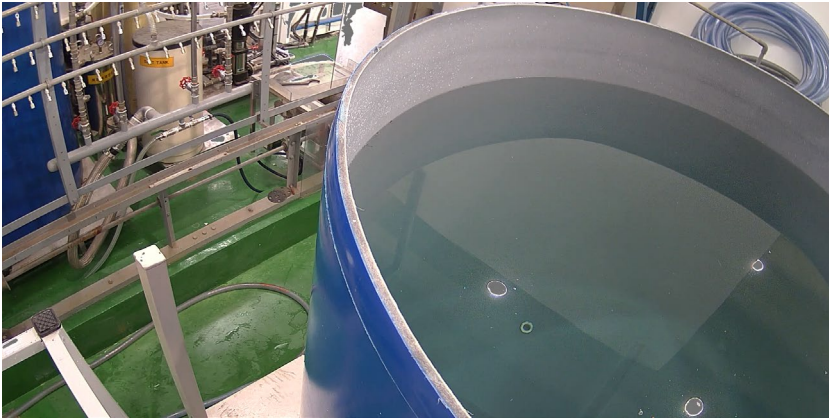
Battery Life(200% ↑)

✓ **Less Space**

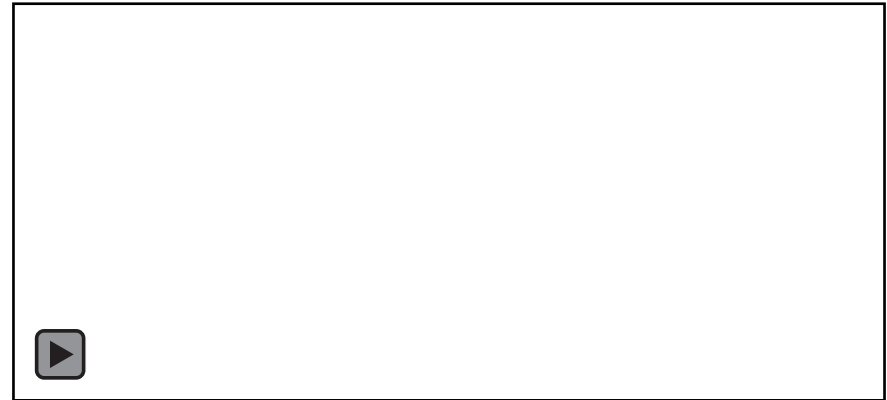
Energy Density(200% ↑)

3 Innovative Technologies

○ Lithium-ion Battery, Safety Test



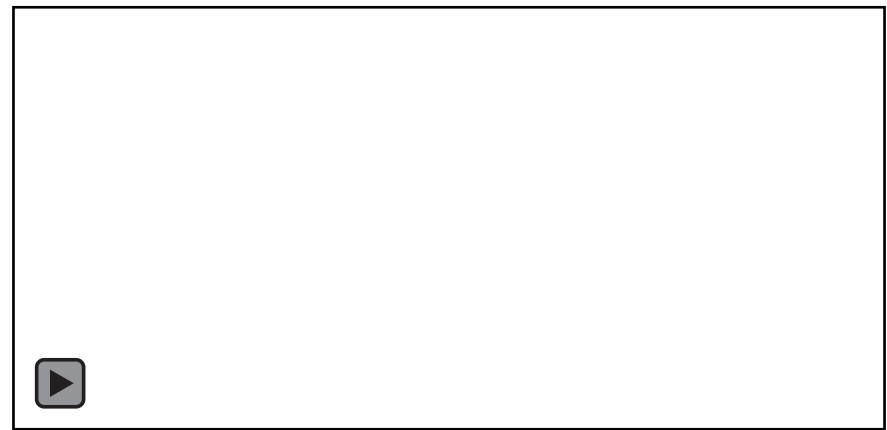
Saltwater Immersion



Shock Test



Fire Exposure Test



Fire Suppression Test

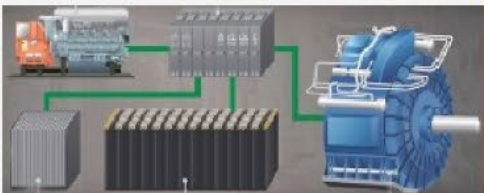
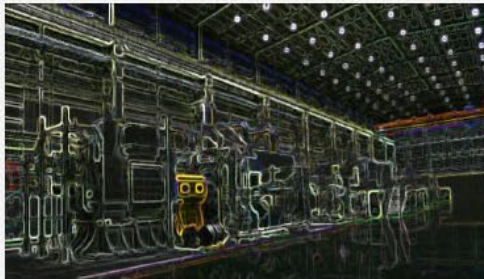
3 Innovative Technologies

○ Lithium-ion Battery, System Level Test

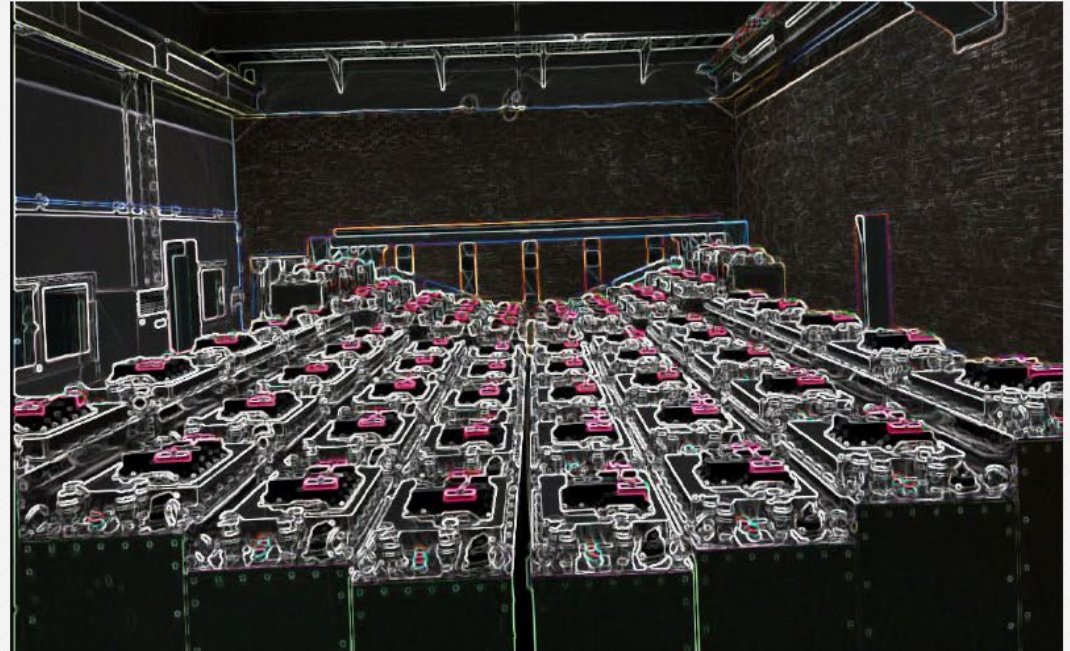
Land-Based Test Site (LBTS)



Battery Room



LBTS

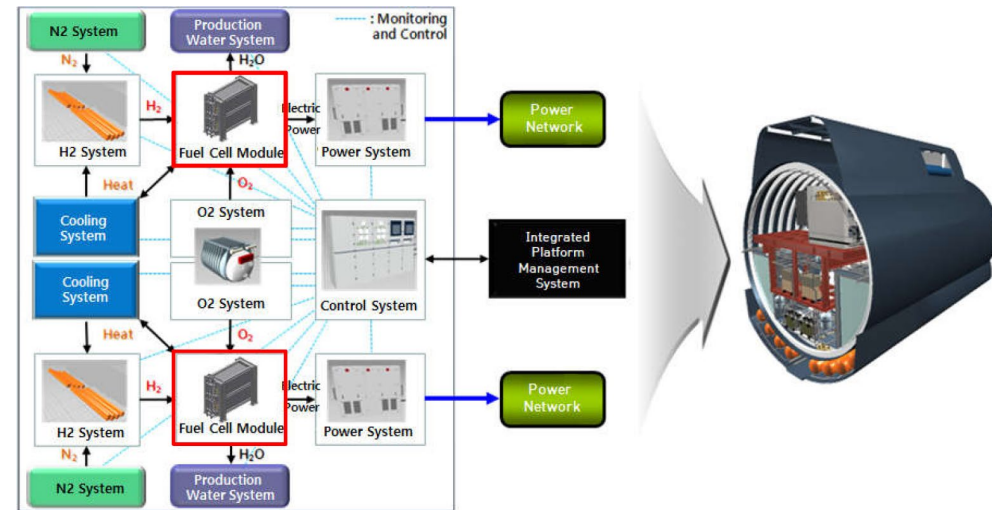


✓ **Full Scale(Group) Demonstration in Land Based Test Site**

3 Innovative Technologies

○ Fuel Cell AIP

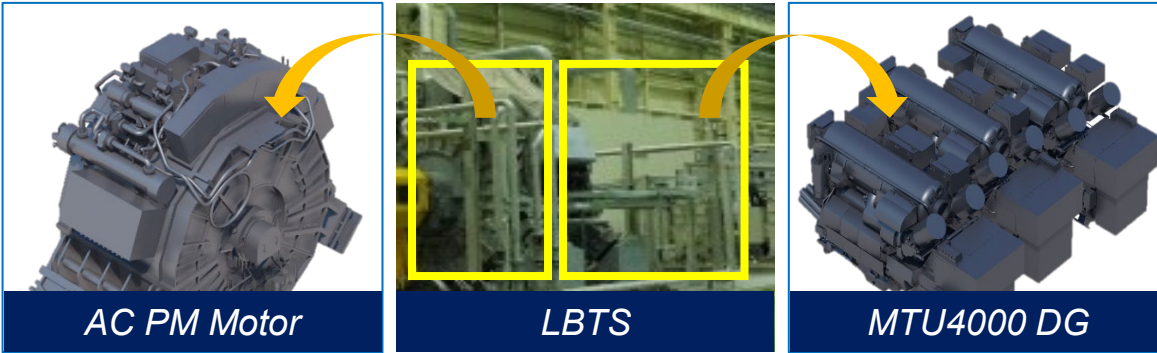
- ✓ **Silent**
- ✓ **No Exhaust Gas**
- ✓ **Free to Diving Depth**
- ✓ **Free to Sea Water Temperature**
- ✓ **Reliability**
- ✓ **Eco-Friendly**
- ✓ **Great Potential with the Rapid Development of Commercial Hydrogen Technology**



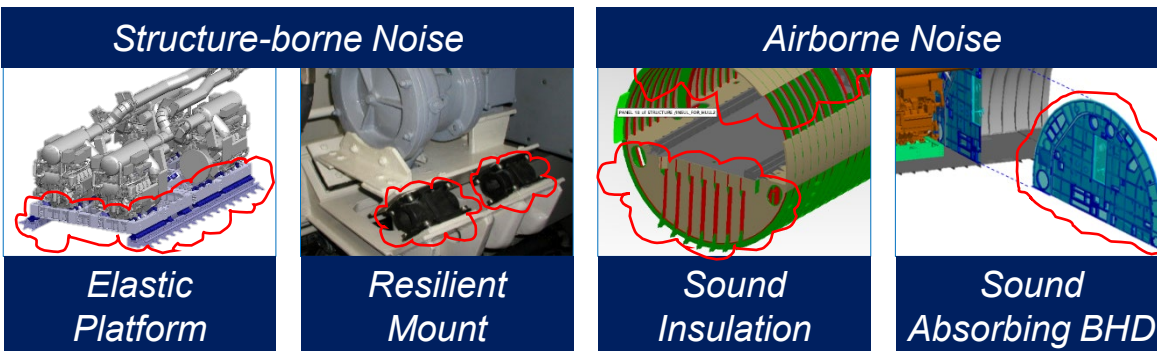
3 Innovative Technologies

○ Noise Reduction

Silent Propulsion System



Noise & Vibration Solution



Anechoic Tile



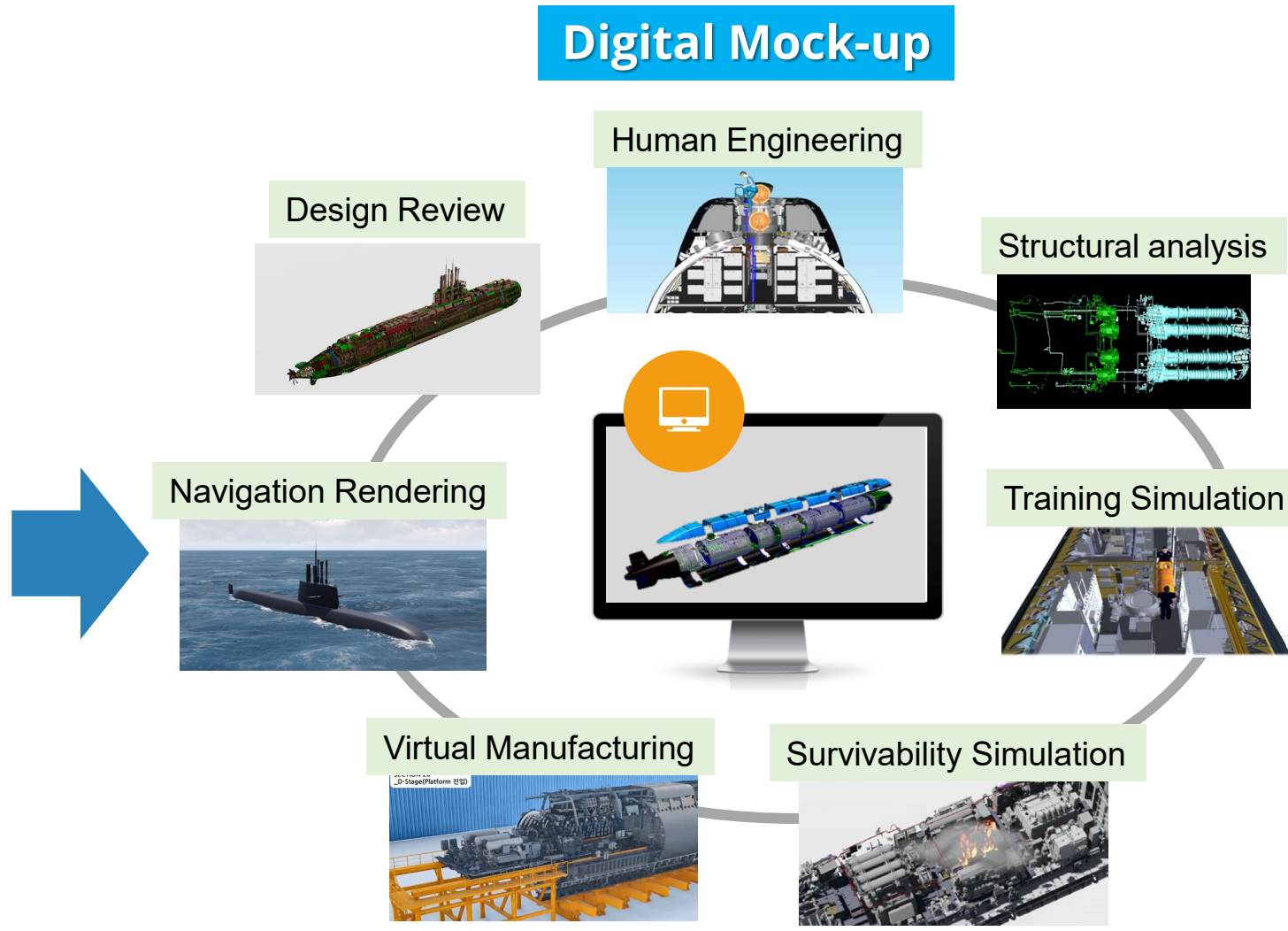
3 Innovative Technologies

○ Digital Technology : Digital Mock-Up

Physical Mock-up



Digital Mock-up



3 Innovative Technologies

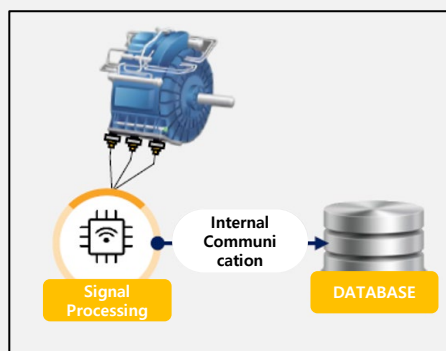
○ Digital Technology : CBM+(Condition Based Maintenance)

Data Collection

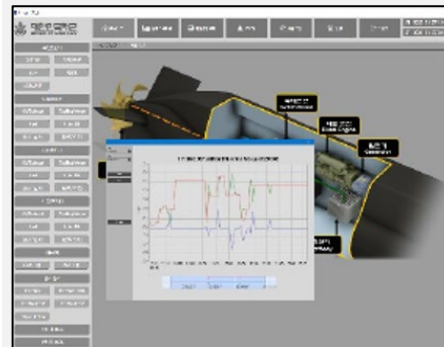
Monitoring

Sensing Anomaly

Diagnosis



- Gathering Data from the sensors of each equipment.
- Collecting Data in the ship's Database storage.



- Monitoring of the sensor signal in Real-Time.



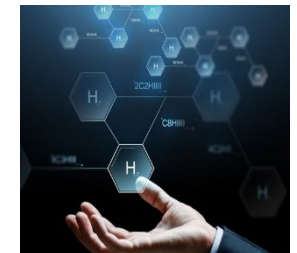
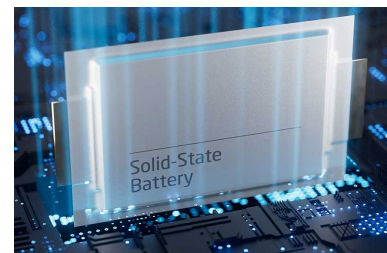
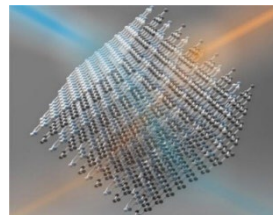
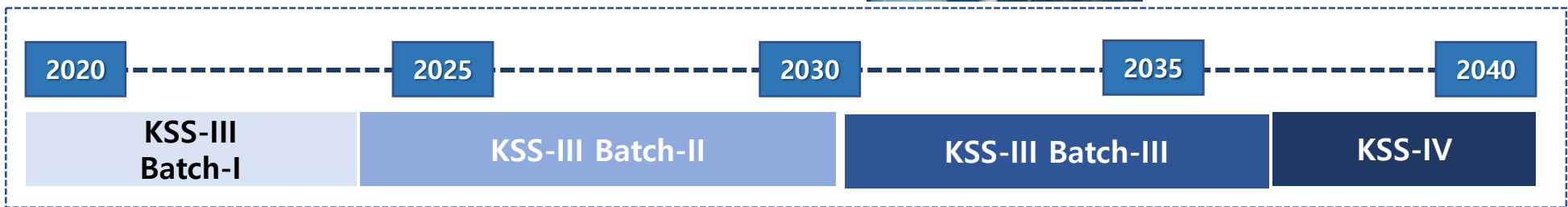
- Comparing the sensor signal to the normal status and sorting the abnormal data.



- Utilizing the AI algorithm to figure out the causality of anomaly and Suggesting corrective actions to the crews.

4 Conclusion

- We are living in an Unpredictable Security Environment
- Series of recent commercial technology developments are showing us the new passages to overcome the limitation of conventional submarines.
- We will lead the future development of conventional submarine by KSS-III program.



Q & A



Thank you !

