# 'Game Changer'of Conventional Submarine KSS-III Batch-II

Director General of KSS-III Program Group Defense Acquisition Program Group Republic of Korea



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- Director General, KSS-III Program
- Ph.D. in Nuclear Engineering(Seoul Nat. Univ.)
  - Former Career



- Underwater Force Development Officer, JCS(2013)
- Commanding Officer, ROKS ChoiMuSeon(Type 209)(2014)
- Naval Strategic Planning Officer, ROK Navy HQ(2016)
- Commanding Officer, ROKS AhnJungGeun(Type 214)(2018)



# 1 Limitations of Conventional Submarine

# Maneuverability?

방위사업청





# Low Operational Risk?



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

Breakthrough

# 2 Game Changer, KSS-III Submarine

#### ○ Why? 3,000<sup>+</sup>ton Conventional Submarine?



# 2 Game Changer, KSS-III Submarine

#### O Incremental Development



# 2 Game Changer, KSS-III Submarine





✓ World's Largest Diesel-Electric Submarine

✓ Less Acoustic Noise Level

- ✓ Longer Detection Range
- Higher Survivability & Endurance

#### Enhanced Precision Strike Capability





#### ○ LION Battery



Lithium-Ion battery Systems

✓ Longer Operation Range

Cruising Speed(160% ↑)

✓ Less Maintenance

Lithium-Ion battery Systems

Battery Life(200% ↑)

✓ Less Space
 Energy Density(200% ↑)

Lithium-Ion battery Systems

*Max.* Speed(300% ↑)

○ Lithium-ion Battery, Safety Test



#### **Saltwater Immersion**



방위사업청

#### **Shock Test**

![](_page_10_Figure_6.jpeg)

#### **Fire Suppression Test**

![](_page_11_Picture_1.jpeg)

#### ○ Lithium-ion Battery, System Level Test

#### Land-Based Test Site (LBTS)

![](_page_11_Picture_4.jpeg)

#### ○ 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

![](_page_12_Picture_9.jpeg)

![](_page_13_Picture_1.jpeg)

#### ○ Noise Reduction

#### Silent Propulsion System

![](_page_13_Picture_4.jpeg)

![](_page_13_Picture_5.jpeg)

![](_page_13_Picture_6.jpeg)

#### *MTU4000 DG*

#### Anechoic Tile

![](_page_13_Picture_9.jpeg)

# **Noise & Vibration Solution**

![](_page_13_Picture_11.jpeg)

![](_page_14_Picture_1.jpeg)

○ Digital Technology : Digital Mock-Up

![](_page_14_Figure_3.jpeg)

![](_page_15_Picture_1.jpeg)

#### ○ Digital Technology : CBM+(Condition Based Maintenance)

Monitoring

Data Collection

![](_page_15_Picture_4.jpeg)

![](_page_15_Picture_5.jpeg)

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

# 4 **Conclusion**

![](_page_16_Picture_1.jpeg)

- 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.

![](_page_16_Picture_5.jpeg)

# Q & A

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# Thank you !