Space and Missile Systems Center
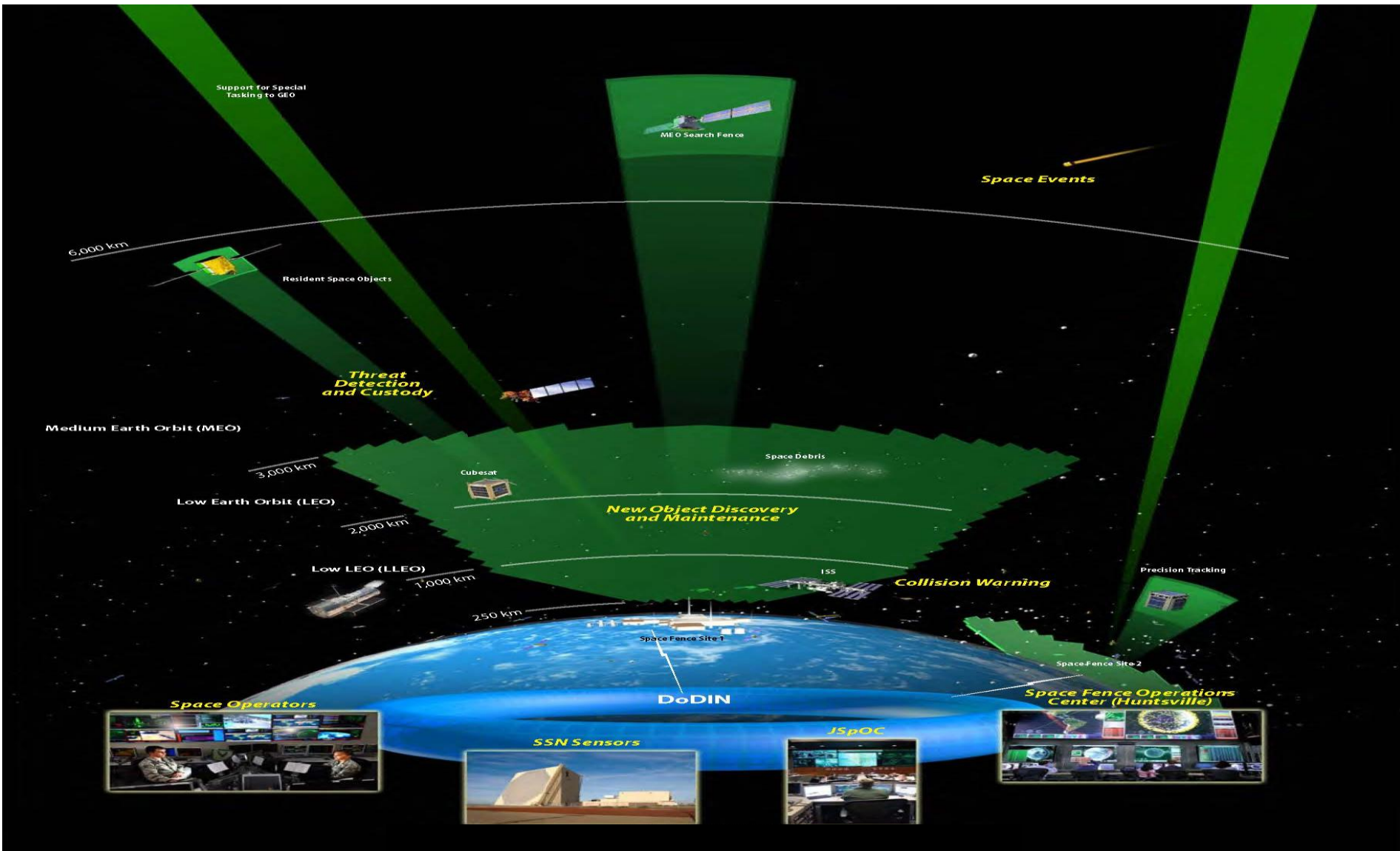
Space Fence
Overview Briefing

NDIA SE Conference
25 Oct 2017

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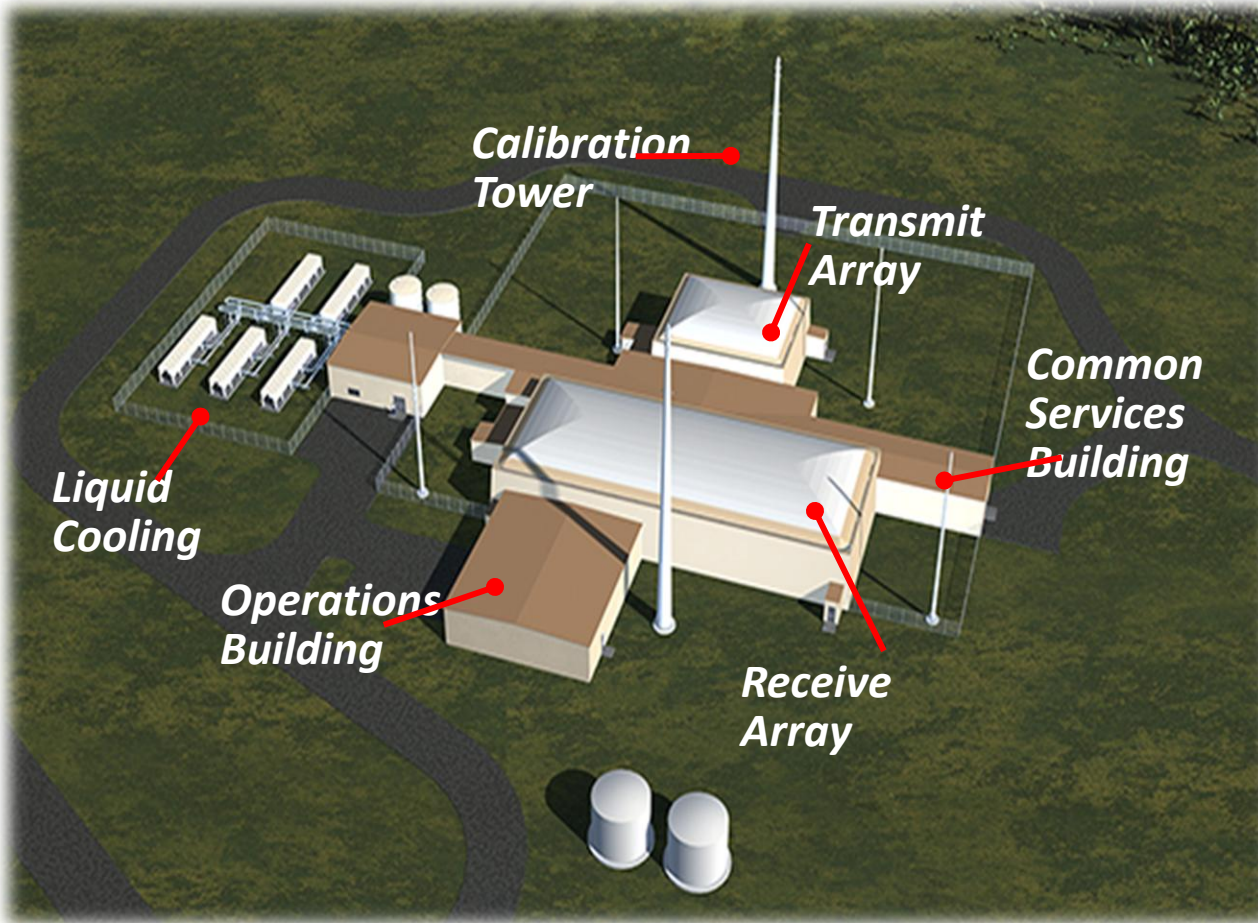*dana.whalley@us.af.mil*

Building the Future of Military Space

Space Fence

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Space Fence – Sensor Site
(Inc1 – Kwajalein)

Calibration Tower

Transmit Array

Common Services Building

Liquid Cooling

Operations Building

Receive Array

➢ Space Fence

- ➢ Largest S-band Phased Array radar every built
- ➢ Nearly 1 million lines of code
- ➢ Significant radar manufacturing effort
- ➢ First Net-centric radar supporting space ops
- ➢ Located on a remote island in the South Pacific

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Space Fence – Sensor Site

(8 Sep 2016)

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Risk Management

- **Risk Management works!**
  - **Major risks mitigated to date**
    - **Software Productivity, ULSD Fuel, JMS Interface, Radome Failure due to Wind**
  - **Receive Array Sensitivity**
    - **Pre-CDR analysis showed better than expected radar performance**
    - **Reducing the array size was an opportunity but also a significant risk**
    - **Joint mitigation activities using CDR prototype, MIT/LL simulator, Integrated Test Bed**
    - **$11M savings pushed into management reserve**
- **PM's Tips for Successfully Risk Management**
  - **Hire a knowledgeable risk manager, find a good risk management plan**
  - **Keep the process simple: good tool, limit number of risks, short meetings**
  - **PM is risk management board chairman but Chief Engineer drives the train**
  - **If you're spending a lot of time/energy on something look for the hidden risk**
  - **Share risks with your contractor, establish joint risks/opportunities**
  - **Highlight risk success stories to the entire team**

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Space Fence Lessons Learned

- **Acquisition Strategy: "You have to spend money to save money"**
  - **USAF invested $364M into the program prior to EMD phase**
    - 3 SDR contracts (Requirement Trade Offs), 2 PDR contracts (Technical Maturity via prototyping)
    - Simplified Milestone B decision
    - 66% complete, 2-3% cost growth/1-2 months delay to IOC (mainly due to facility construction)

- **CDR: "mature hardware/software design backed by test data on production-based hardware, TPMs show positive margin in the design and project the program will meet all program KPPs"**
  - **Make the CDR Milestone the focus of your entire team**
    - Start tracking entry/exit criteria 6 months prior, update weekly, share with contractor
    - Work issues early, review draft CDRLs, drive documents to closure
    - Crush the details at the Design Walkthrough, no surprises at CDR

- **Manufacturing: "Measure twice cut once"**
  - **Emphasize design maturity over production schedules**
    - Perform low volume Proof of Design, Proof of Manufacturing runs
    - Eliminate 'white wires' before production start up
    - 15K LRUs (85-92% yields) completed on schedule

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