The Challenges of Implementing the New ILS Program for the US Navy and Marine Corps

IES-ALC Technology Meeting

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The Navy ILS Program - A New Program of Record

Outline

- USN and USMC Aviation Background: Aircraft, Airfields, NAVAIDs
- Navy-USMC ILS Program: Today and Future
- ILS Program Opportunities for Engineering and Construction
- Summary and Questions

Navy Aviation: Aircraft

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Marine Corps Aviation: Aircraft

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VH-60


KC-130


AV-8B

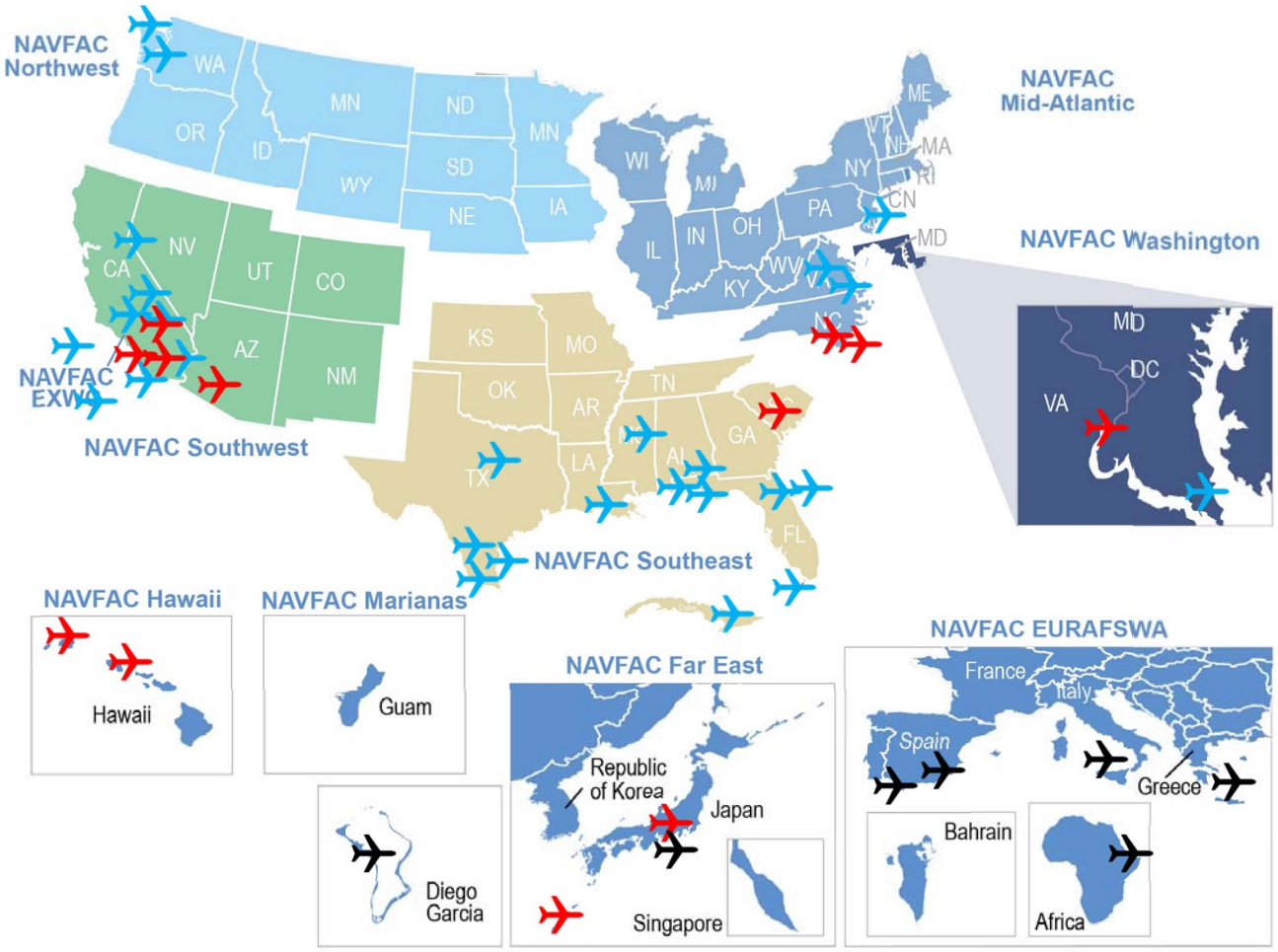

AH-1


CH-53

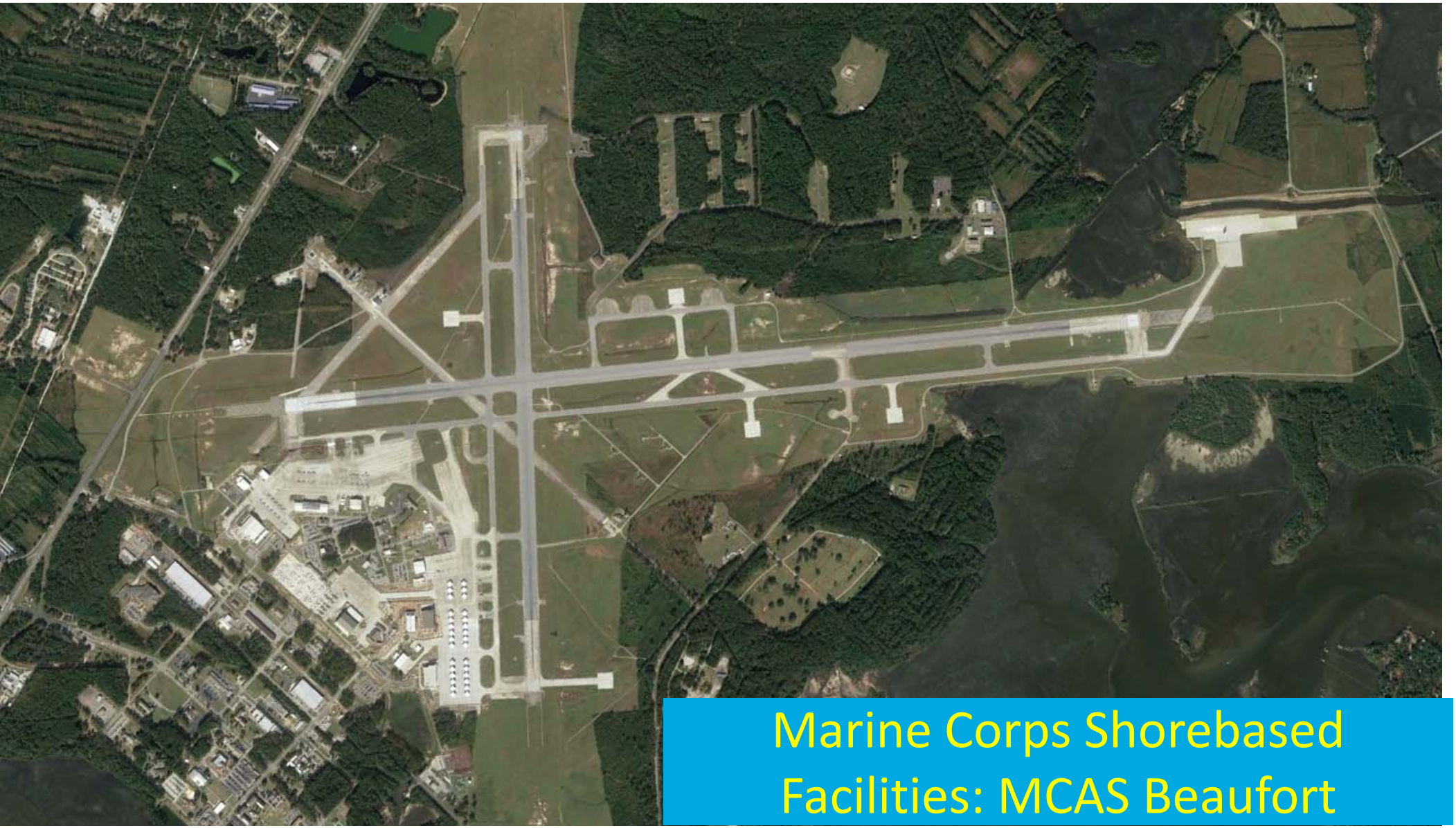
F/A-18

Navy and Marine Corps Aviation: Airfields Worldwide

57 Major Airfields
plus Outlying Fields
and Air Facilities



Navy Shorebased Facilities: NAS Oceana



Marine Corps Shorebased Facilities: MCAS Beaufort

Portable Floating Airfield Facilities

Shorebased Facilities are Required to Train for Shipboard Ops.

Simulated Carrier Decks

Simulated Carrier Deck – OLF Fentress, NAS Oceana

Navy and Marine Corps Visual Landing NAVAIDs

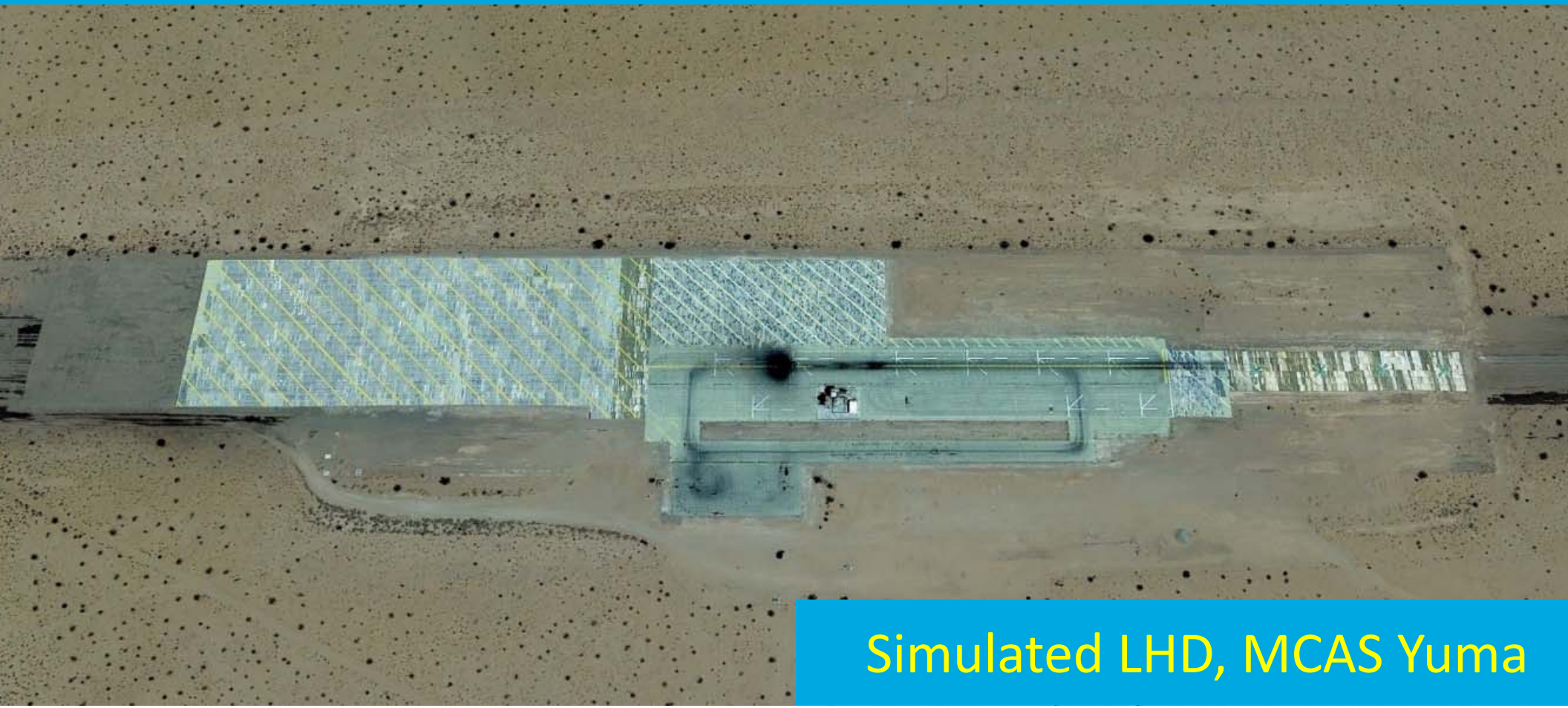
- Landing VISAIDs
  - Fresnel Lens Optical Landing System (FLOLS)

Navy and Marine Corps Visual Landing NAVAIDs

- Landing VISAIDs
  - Improved Fresnel Lens Optical Landing System (IFLOLS)

Expeditionary Floating Airfield Facilities

Shorebased Facilities are Required to Train for Shipboard Ops



Simulated LHD, MCAS Yuma

Instrument and Visual NAVAIDs for Ship VSTOL Operations

- Shorebased simulated decks require modified visual landing aids to take into account the difference in pilots visual cues for the ship versus the land simulator

Shipboard Visual NAVAIDs – New Markings

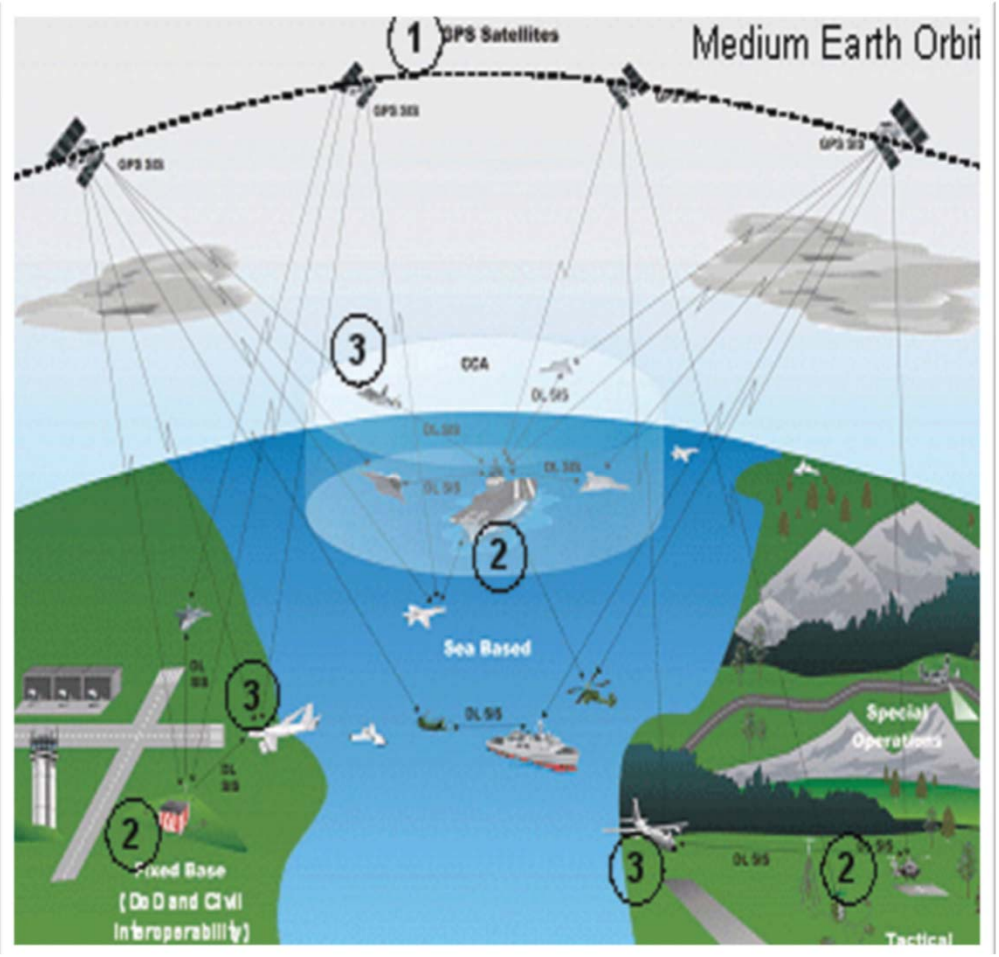
Navy and Marine Corps Aviation: Electronic NAVAIDs

Precision Approach Radar (PAR) AN/FPN-63

TACAN Shorebased, Shipbpoard, & Portable

Navy and Marine Corps Aviation: Electronic NAVAIDs

- GPS
  - Joint Precision Approach & Landing Systems (JPALS)
  - USN and USMC Aircraft Precision Shipboard Landing
  - Supplement or Replace the Precision Instrument Carrier Landing System (ICLS) a Microwave based precision NAVAID
  - Raytheon: IOC: 2019, FOC: 2030



Navy and Marine Corps Aviation: Electronic NAVAIDs

- GPS Critical for Navy UAS Applications
  - X-47B Unmanned Combat Aircraft System (UCAS).
  - Autonomous versus Remotely Piloted

Navy and Marine Corps Aviation: ILS Program

Navy and Marine Corps Aviation: New Aircraft - ILS Equipped for Worldwide Mission Needs

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F/A-18E/F


F-35B and F-35C


P-8A

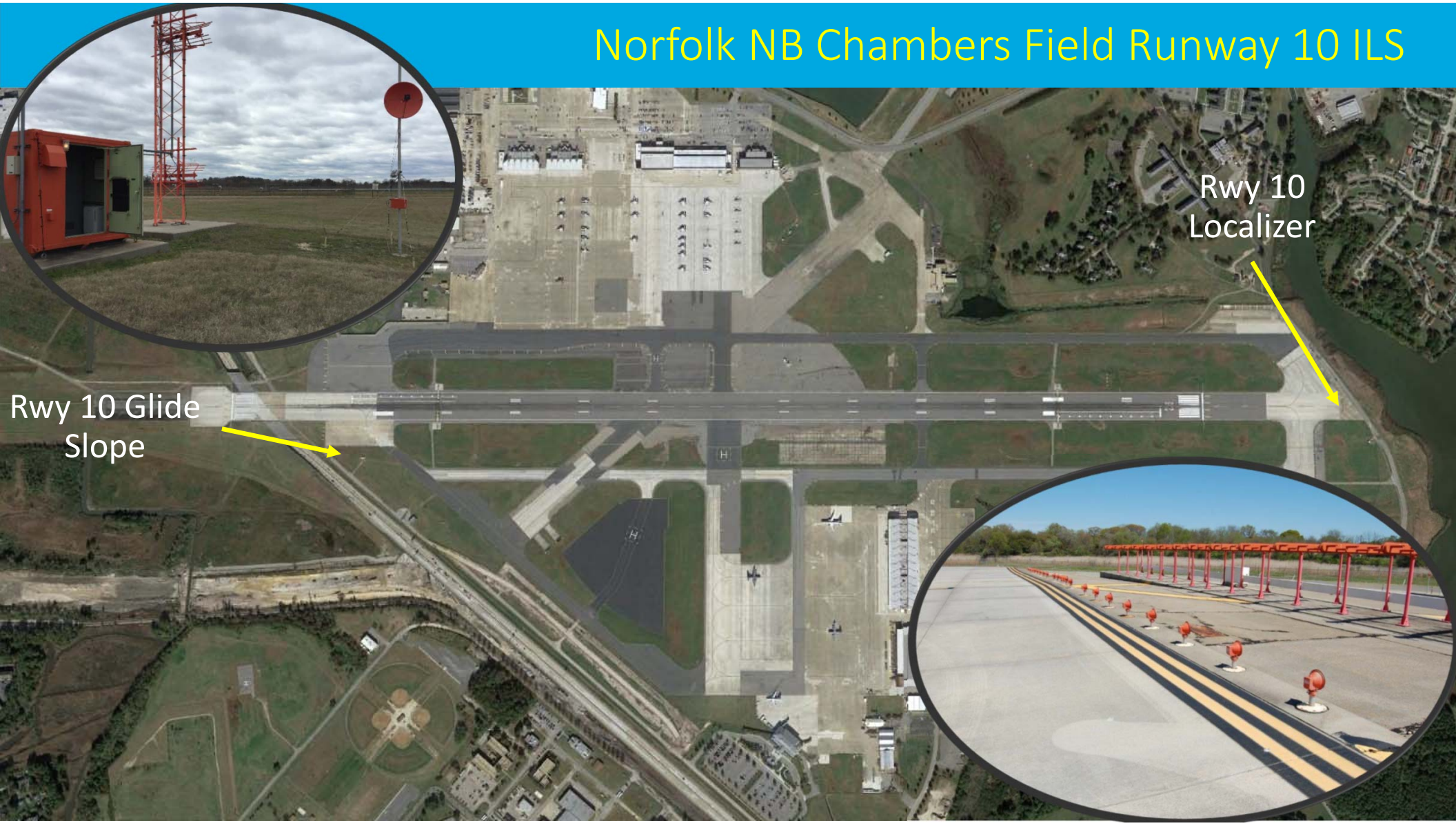

MV-22


EA-18G

Navy ILS Program: Existing Not a Program of Record

- 18 Bases equipped
- Most Navy Mark 1F Versions
  - FAA Joint Use: MCAS Yuma
  - Host Nation: MCAS Iwakuni, Japan
  - AF Lead: JRB/NAS Fort Worth (Former Carswell AFB)
- Locally sustained. No programmatic support
- Multiple configurations and versions

Norfolk NB Chambers Field Runway 10 ILS



MCAS Miramar

ILS Glide Slope Equipment Siting – FAA Guidance

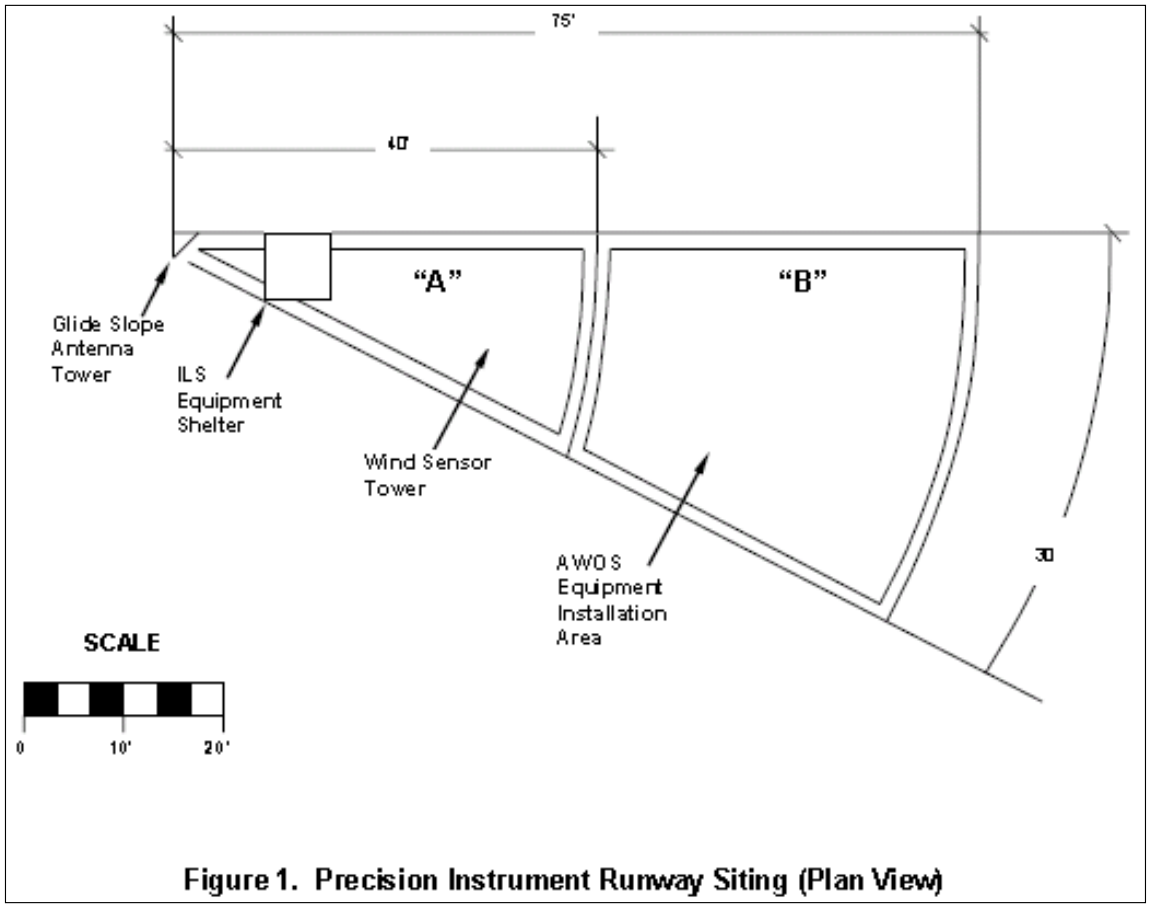
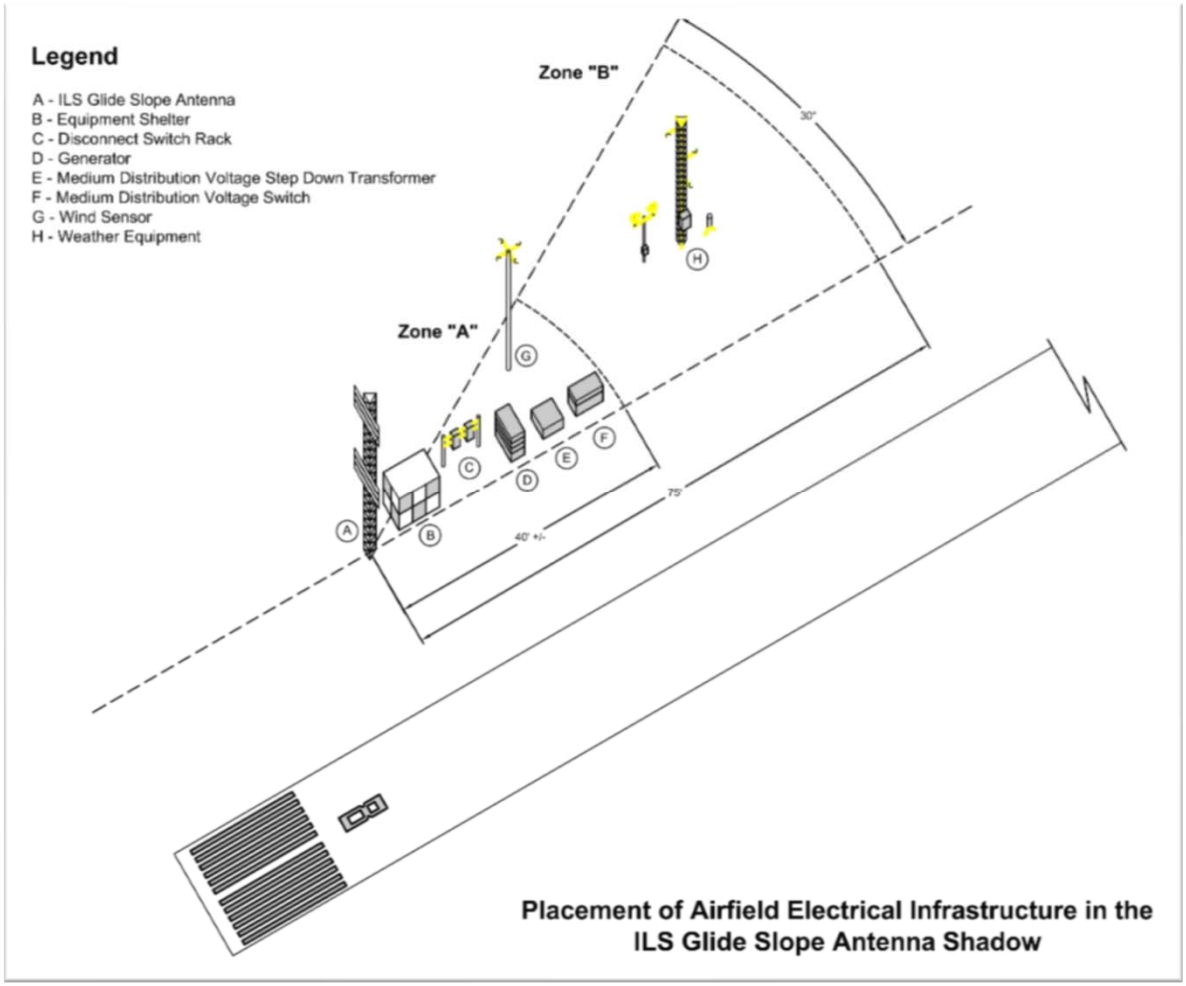
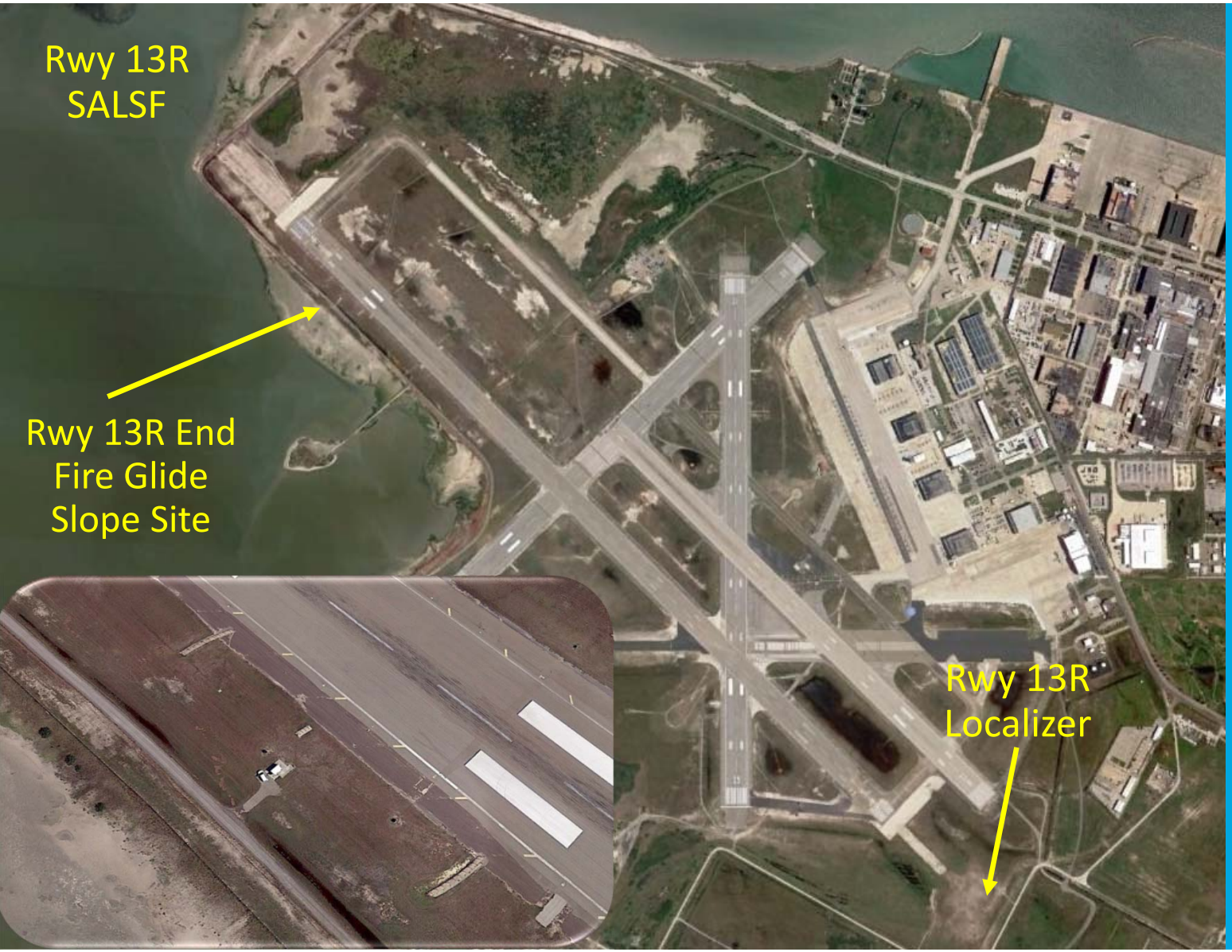


Figure 1. Precision Instrument Runway Siting (Plan View)

Site to Prevent Airfield Electrical Obstructions





NAS Corpus Christi Runway 13R ILS

Navy ILS Program: Proposed Program of Record

- 28 Airfields with Commercial Off the Shelf (COTS) Modern ILS
  - Initial phase. One per airfield. ILS runway determination varies.
  - Some airfields will have multiple ILS. Future phases based on mission need
- Cat I with some Cat II Capable
- Department of Navy (DoN) Programmatic Support
  - Installation and Sustainment Program (FAA Like)
  - Standards and Training
  - RDT&E and Training Sites

Navy ILS Program: NAVAIR PMA-213
Air Traffic Management Systems

- Program Management Office (PMO) for ILS
  - AIR 4.0 Research and Engineering
  - NAS Patuxent River, MD
  - BAE Systems is the Prime technical support contractor
- PMA-213 Programs
  - TACAN (Tactical Air Navigation System)
  - ICLS (Instrument Carrier Landing System – Ship and Shorebased MLS)
  - JPALS (GPS precision approach)
  - NASMOD (DOD/FAA National Airspace System Modernization Program)

Navy ILS Program: Program Plan 2016 to 2023 or so

- ILS Airfields Identified
- Siting Studies: Ohio University Avionics Engineering Center
- Develop Navy-Marine ILS Criteria: CH2M
  - Facilities Requirements Document (FRD)
  - Planning and Design Standards and Process Document
- Base Electronic System Engineering Plans (BESEPs) and Installation Design Plans (IDPs)
  - Airfield Specific Planning and Project Execution Documents
  - Preliminary Design for NAVFAC Infrastructure

Navy ILS Program: Program Plan 2016 to 2023 or so

- NAVAIR ILS Equipment Acquisition Contract
  - Bid in 2016. Awarded in 2017 to Selex. Delivery starting in 2018
  - Model 2100
  - Various Types:
- NAVFIG (Naval Flight Information Group)
  - ILS Procedure Planning and Design or Modification
  - Accurate Sealed Survey Requirements
- NAVFAC ILS Infrastructure Design and Construction Execution
  - Following standards in FRD, BESEPs, IDPs
- NAVAIR
  - ILS Equipment Installation and Commissioning

Navy ILS Program: Engineering and Construction Opportunities

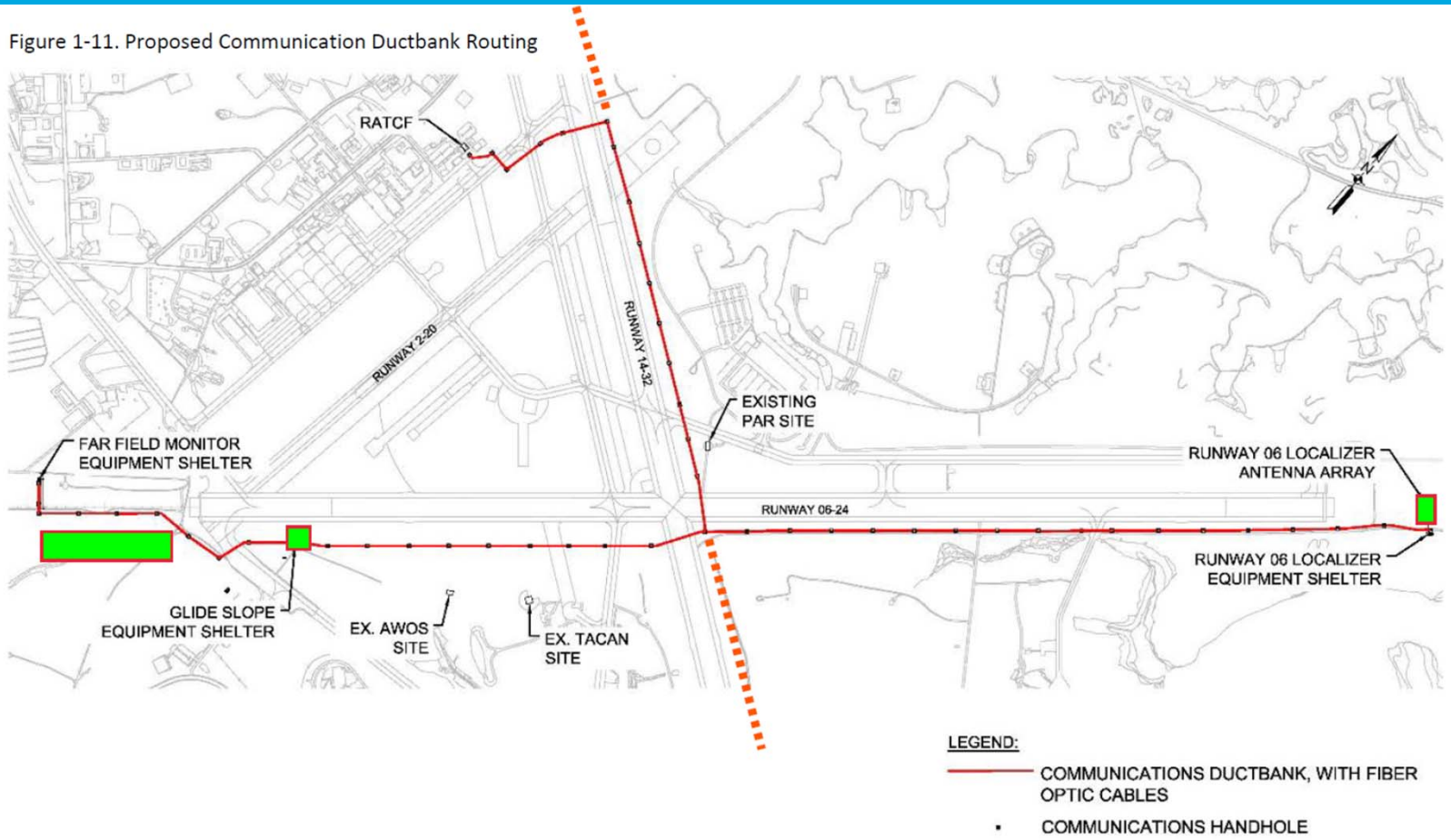
- ILS Infrastructure and Equipment. New and Replacement
  - Typically $2 mil to $4 mil of work
  - NAVFAC Executed Infrastructure
  - NAVAIR Executed Equipment Installation
  - Base Sustainment Program supported by NAVAIR Program

Why $2 mil to $4 Mil of Work?
Common Underground Infrastructure Conditions

- Degraded, Unusable, Unsafe
- Insufficient Capacity

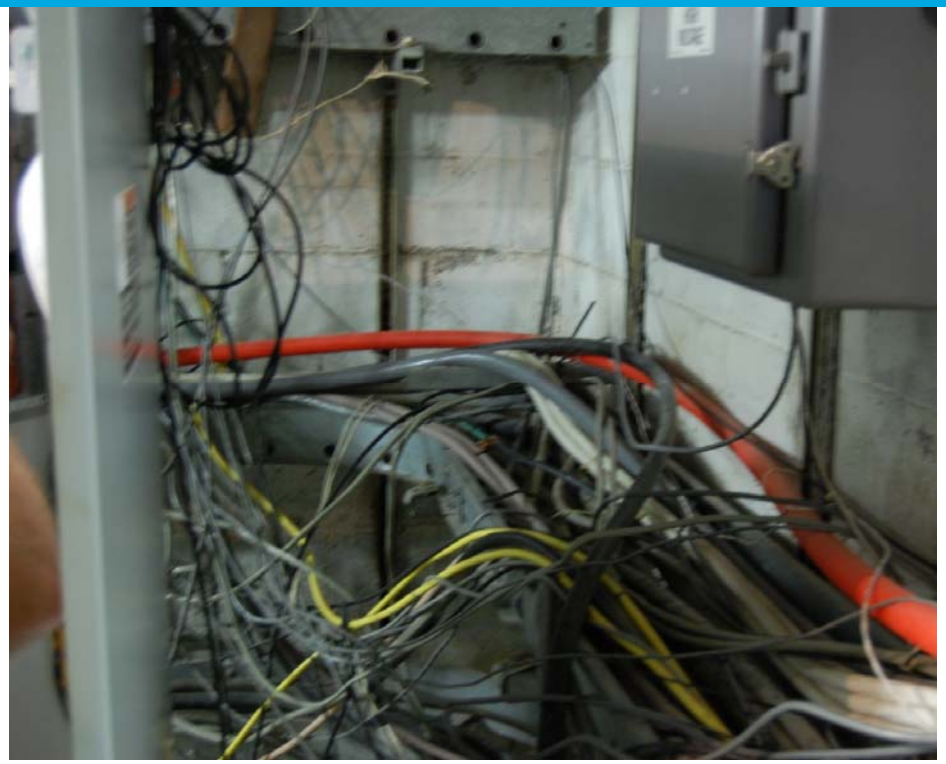
Common Navy ILS and Airfield Comm/Data Infrastructure

Figure 1-11. Proposed Communication Ductbank Routing



Why $2 mil to $4 Mil of Work?
NAS Patuxent River Field Conditions

Why $2 mil to $4 Mil of Work?
NAS Patuxent River – Interior Work



- Finding: Comm routes to new ATCT often runs through base of old ATCT

Navy ILS Program: Engineering and Construction Opportunities

- NAVFAC: ILS Infrastructure Execution at Base Level
  - Design-Bid-Build
    - Design (AEs). Engineers and Surveyors
    - Construction (Contractors)
  - Design-Build
  - Small Business Contracting Often Used
    - Recommendations for use of airfield qualified and experienced firms
  - Often will not be advertised. Base level "MACCs" often used

Navy ILS Program Timeline

- Multi-Year Program – 5 to 10 years
- Siting Studies.
- FRD completed in 2018. UFC like document
- BESEPs and IDPs (Preliminary Design). 28 complete by 2021
- Design. Opportunities should start in 2018
- Infrastructure Construction. First Patuxent River in 2018
- Equipment Installation. Start in 2019. Method TBD.

Navy ILS Program: Summary

- ILS Program. Element of Naval Aviation Modernization Efforts
- New Program of Record. Establishes Standards and Sustainment
- Multi-Year Worldwide and Long Term Effort
- Engineering and Construction Opportunities for IES ALC participants and peers
- Questions

Thank You

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