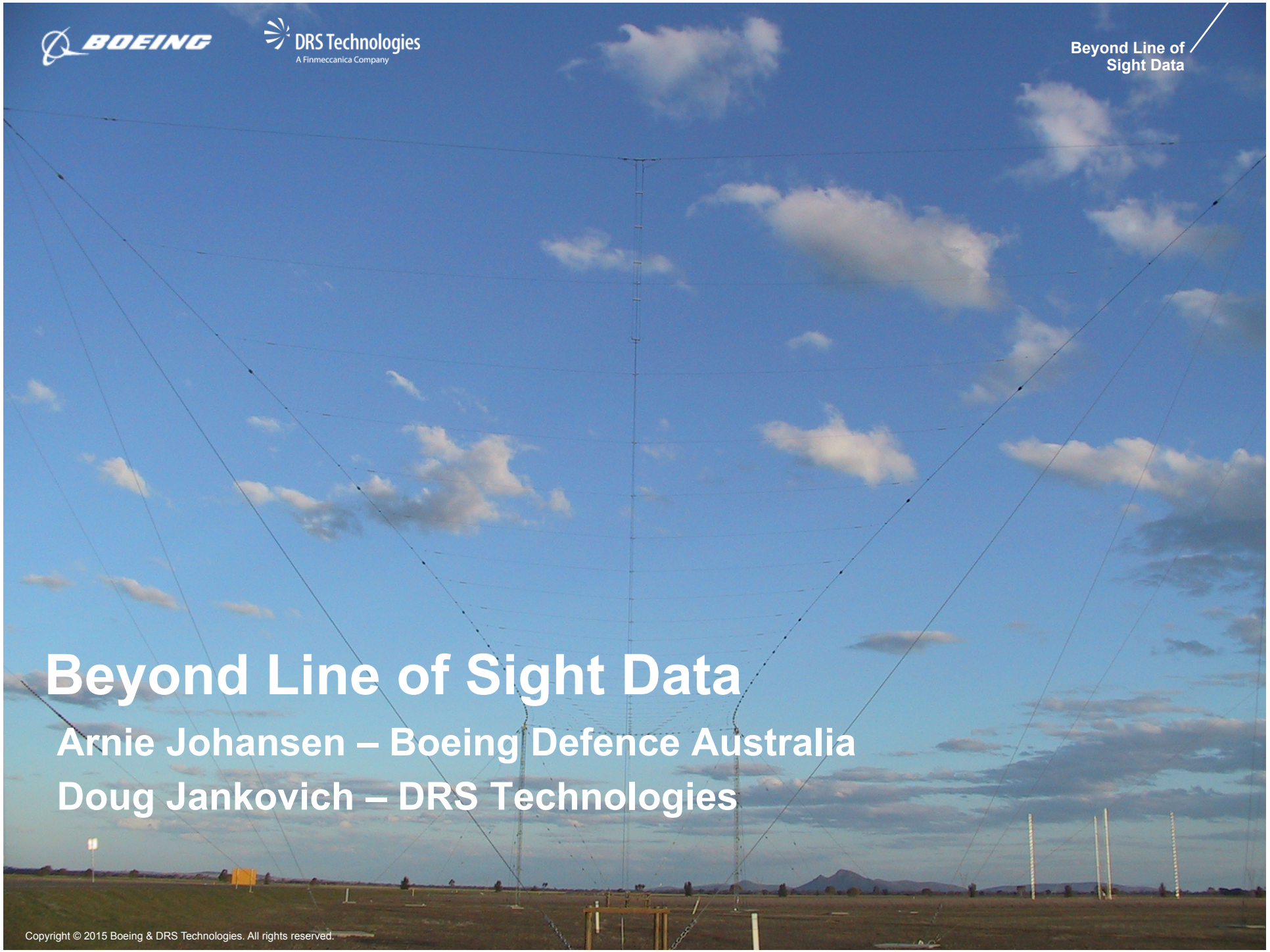
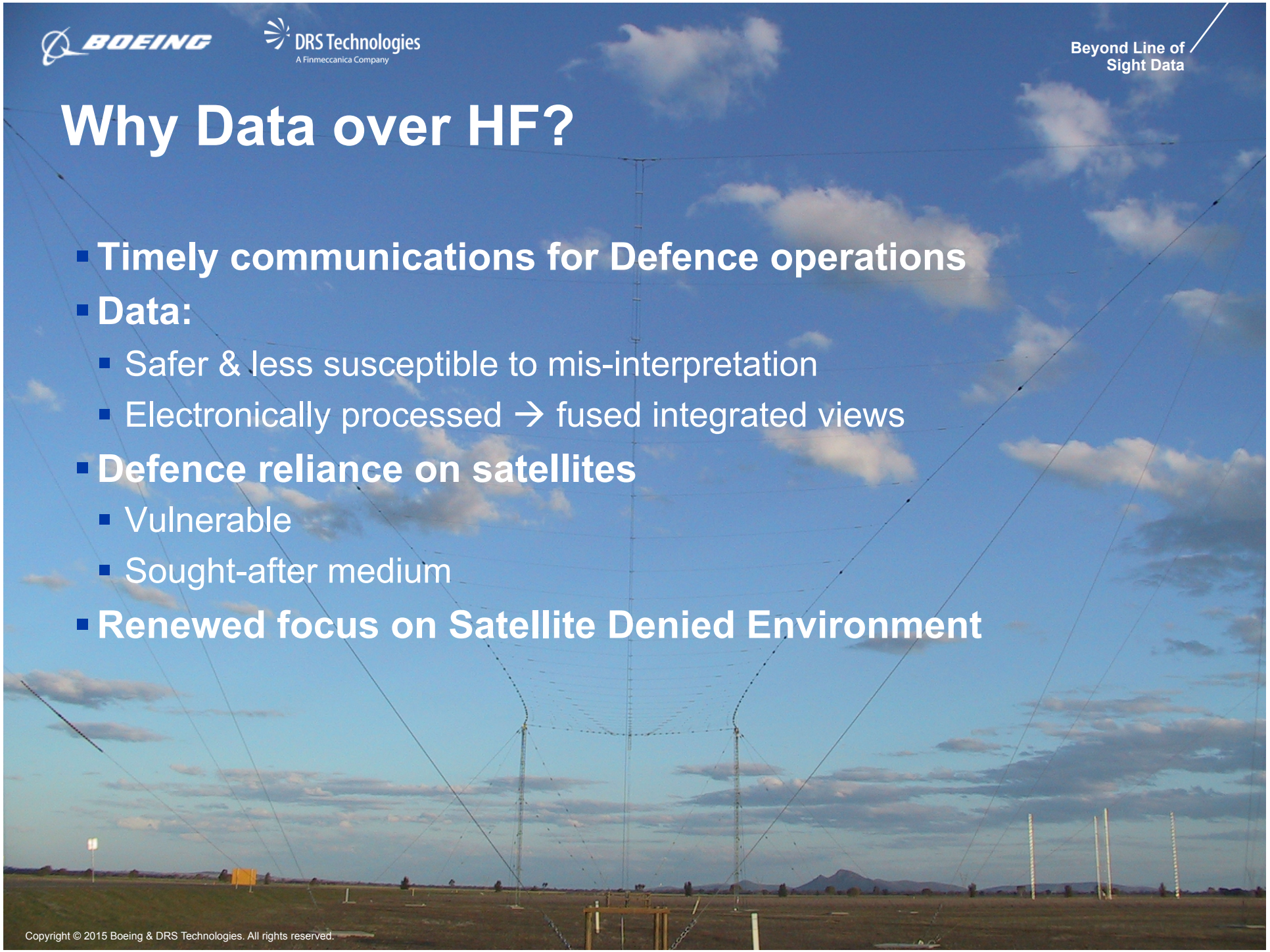


Beyond Line of Sight Data

Arnie Johansen – Boeing Defence Australia
Doug Jankovich – DRS Technologies



Why Data over HF?

- **Timely communications for Defence operations**
- **Data:**
  - Safer & less susceptible to mis-interpretation
  - Electronically processed → fused integrated views
- **Defence reliance on satellites**
  - Vulnerable
  - Sought-after medium
- **Renewed focus on Satellite Denied Environment**

Satellite Denied Environment options

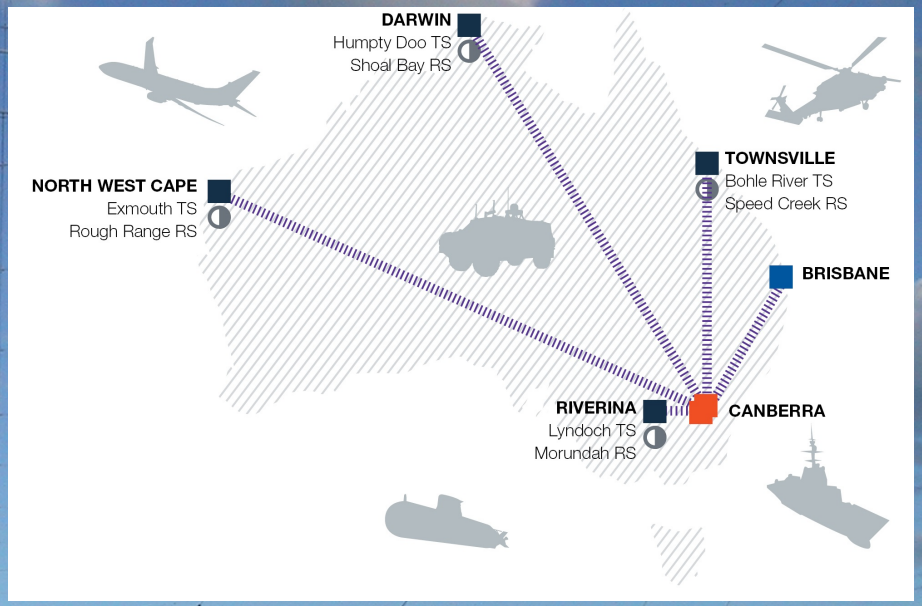
- Main fallback is HF
- Difficult to deny → more survivable
- Well suited secondary medium at all times
- Low cost (once installed)
- HF capacity is lower, increasing with newer technology

BOEING

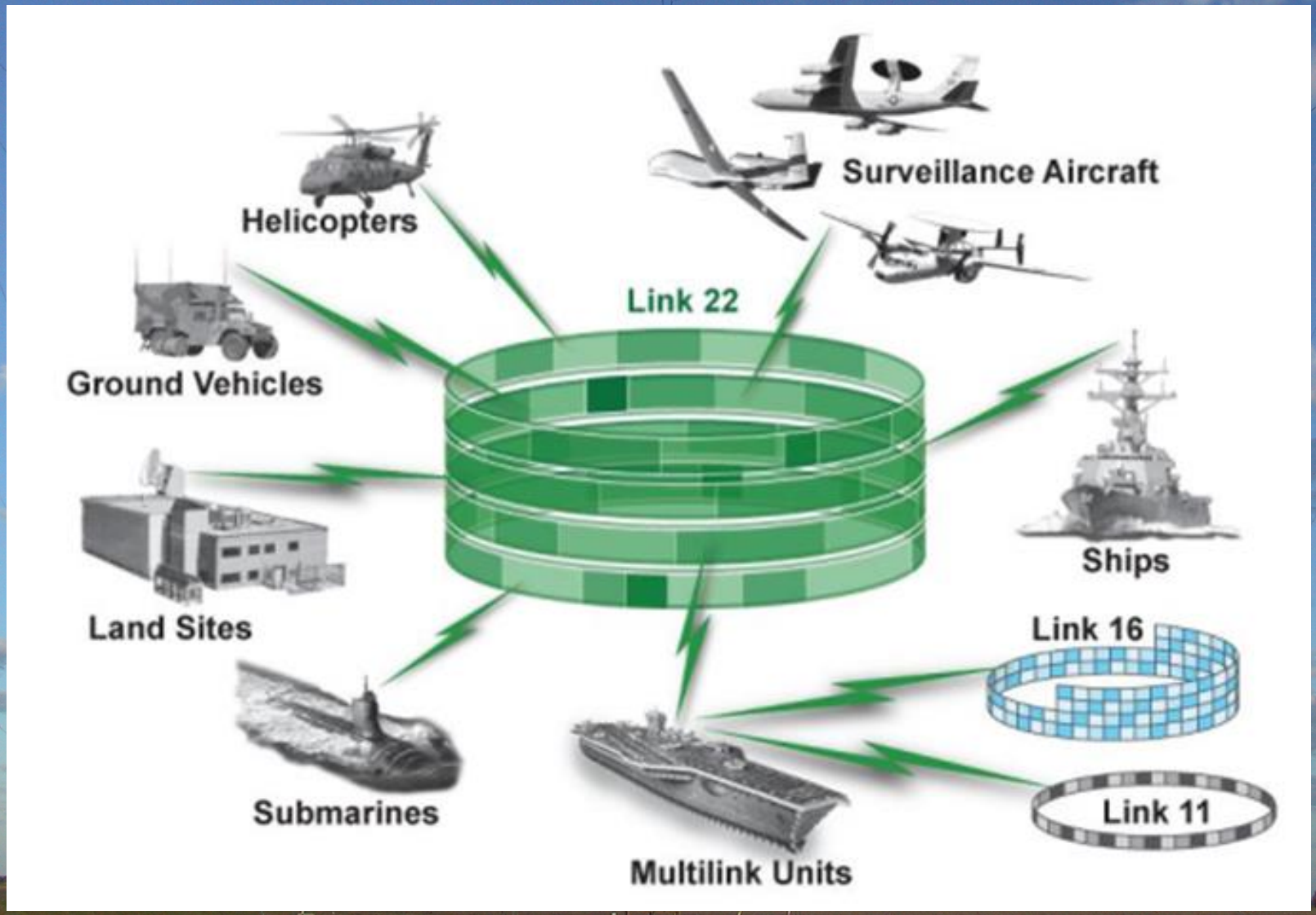
DRS Technologies
A Finmeccanica Company

Data over DHFCS

- **Network of HF sites**
  - Automated switching
  - $^1/_3$ global coverage
- **Provides data traffic over HF for ADF today**
  - Organisational Messages
  - Data traffic to platforms in EMCON
- **Automation of HF usage**
  - Simplifies comms planning
  - Reduced need for HF experts

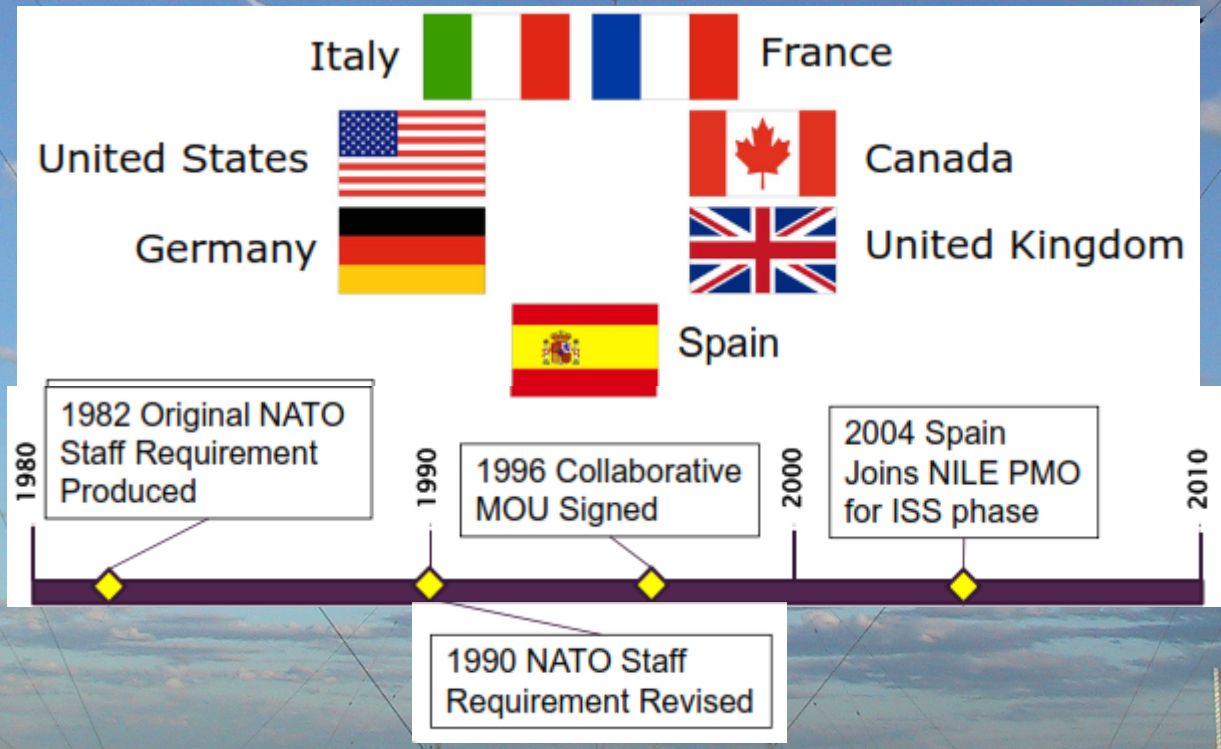


Link-22



Maturity of Link-22

Link-22, formerly NATO Improved Link Eleven (NILE) was established as a collaborative 7-nation project made up of the following member nations:



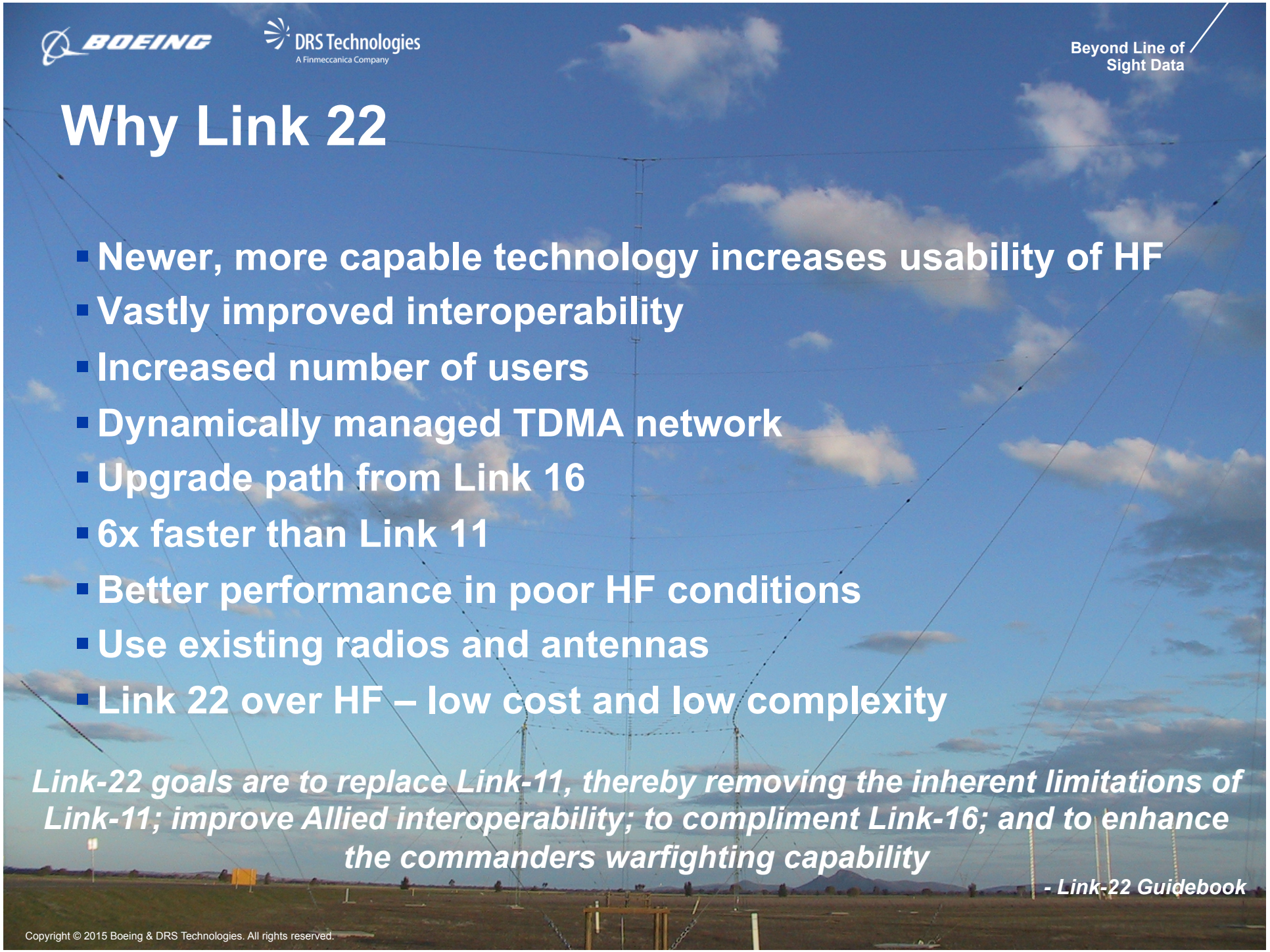
BOEING

DRS Technologies
A Finmeccanica Company

Beyond Line of Sight Data

Functional Roles of Link-22

- Command and Control
- Status
- Surveillance
- Electronic Warfare
- Weapons Coordination
- Intelligence
- Threat Warning and Alert
- Navigation
- Network Management
- Free Text



BOEING

DRS Technologies
A Finmeccanica Company

Beyond Line of Sight Data

Why Link 22

- Newer, more capable technology increases usability of HF
- Vastly improved interoperability
- Increased number of users
- Dynamically managed TDMA network
- Upgrade path from Link 16
- 6x faster than Link 11
- Better performance in poor HF conditions
- Use existing radios and antennas
- Link 22 over HF – low cost and low complexity

Link-22 goals are to replace Link-11, thereby removing the inherent limitations of Link-11; improve Allied interoperability; to compliment Link-16; and to enhance the commanders warfighting capability

- Link-22 Guidebook

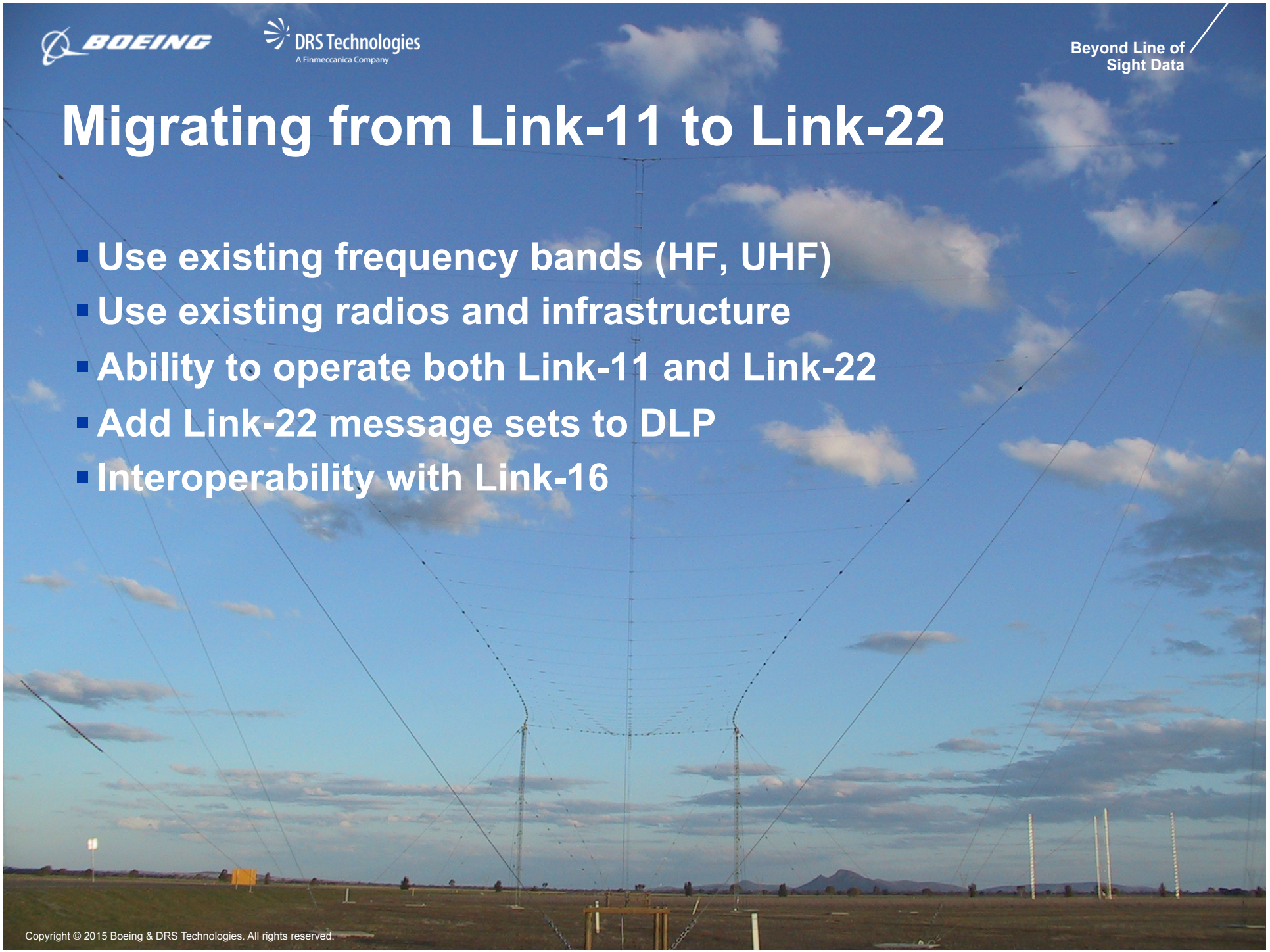
BOEING

DRS Technologies
A Finmeccanica Company

Beyond Line of Sight Data

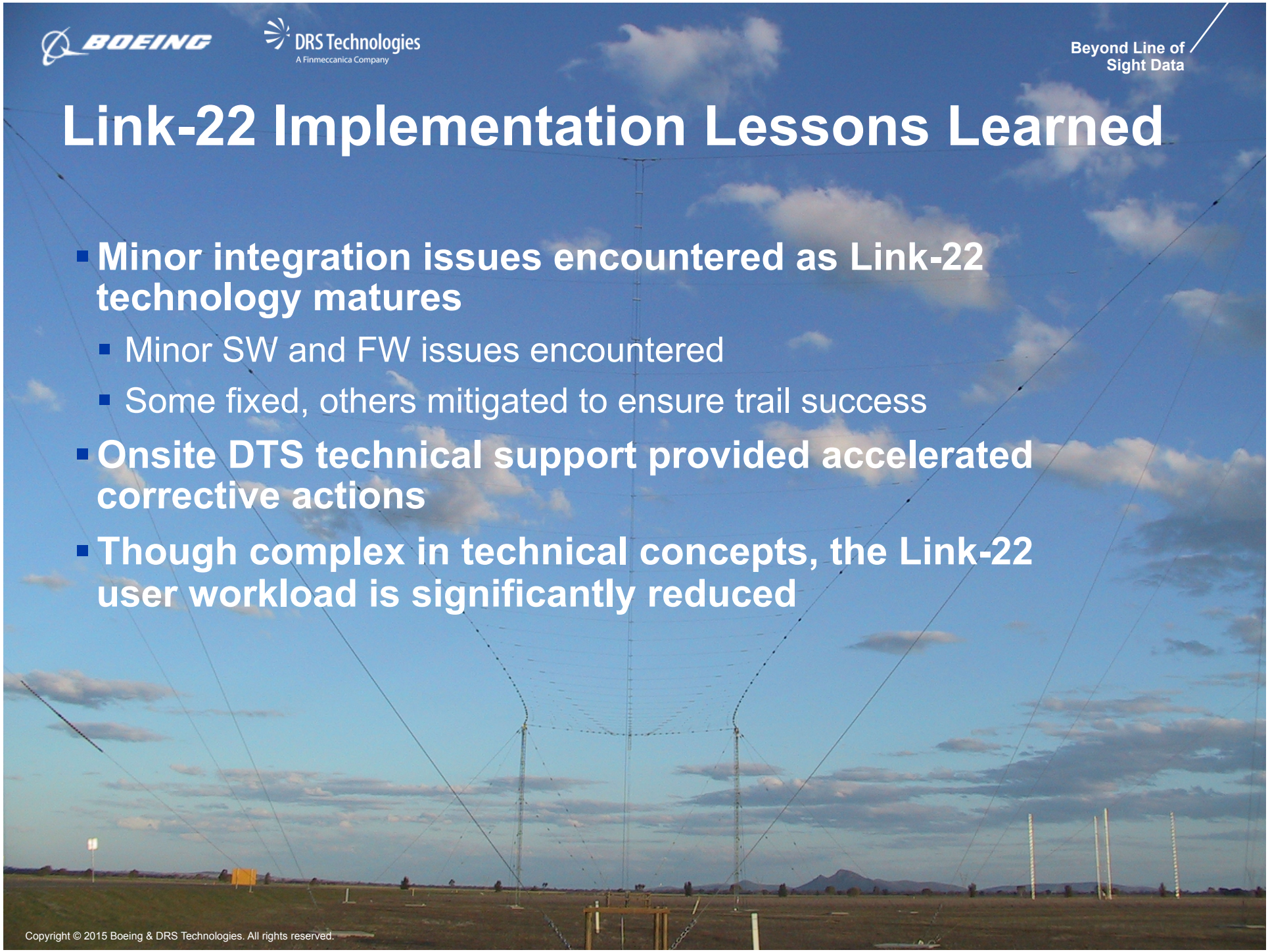
Current Link-22 Global Footprint

- Increasing interest in Link-22 from around the world
- Some nations have initial fielding of Link-22
- Lack of LLC delays IOC
- Trails currently occurring in numerous nations
- Procurement will increase once LLC is available



Migrating from Link-11 to Link-22

- Use existing frequency bands (HF, UHF)
- Use existing radios and infrastructure
- Ability to operate both Link-11 and Link-22
- Add Link-22 message sets to DLP
- Interoperability with Link-16



BOEING

DRS Technologies
A Finmeccanica Company

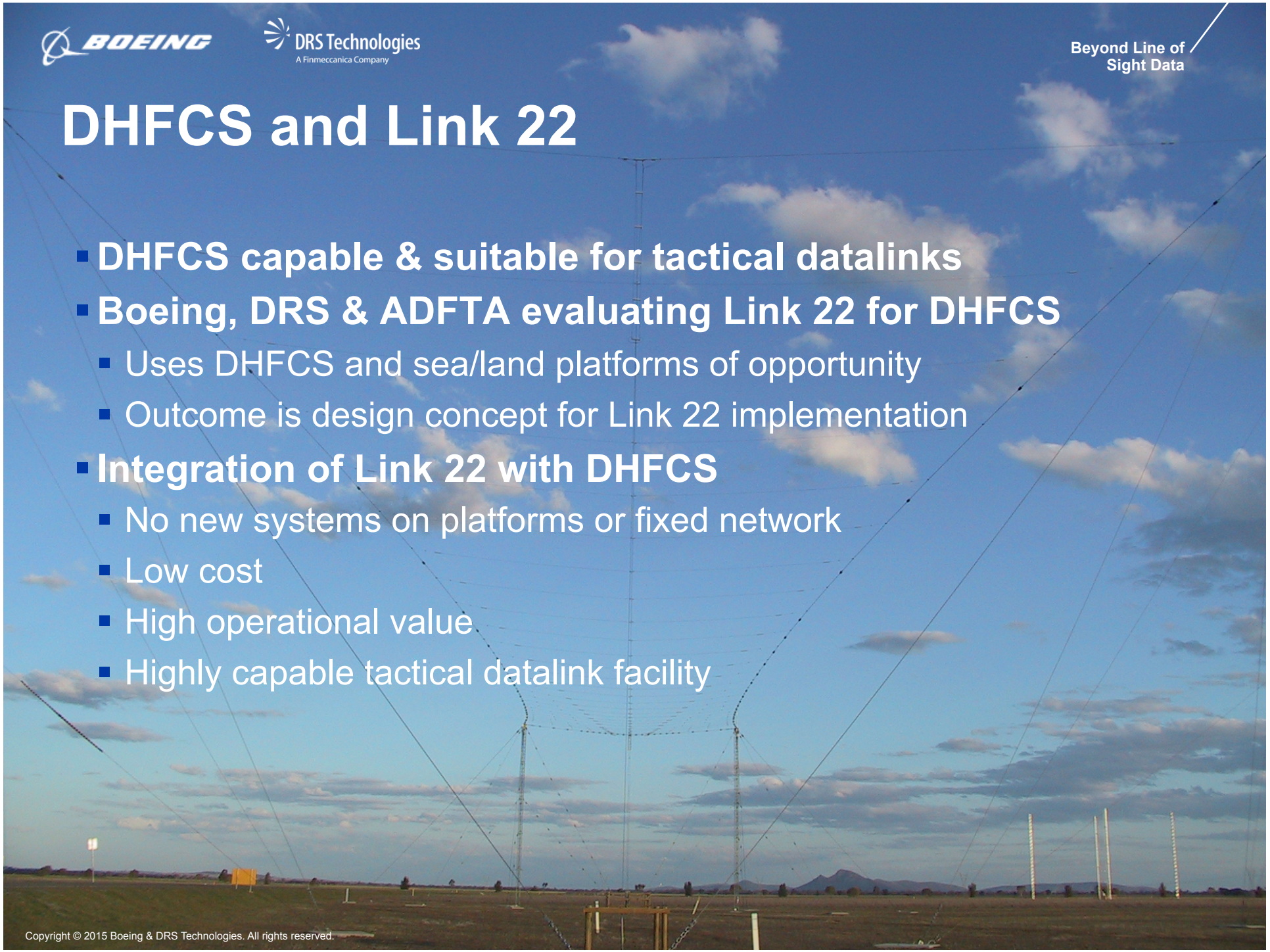
Beyond Line of Sight Data

Link-22 Implementation Lessons Learned

- **Minor integration issues encountered as Link-22 technology matures**
  - Minor SW and FW issues encountered
  - Some fixed, others mitigated to ensure trail success
- **Onsite DTS technical support provided accelerated corrective actions**
- **Though complex in technical concepts, the Link-22 user workload is significantly reduced**

Opportunities to Link-22 Uses

- **Split site capability to provide seamless National Link-22 coverage**
  - Air
  - Land
  - Sea



DHFCS and Link 22

- **DHFCS capable & suitable for tactical datalinks**
- **Boeing, DRS & ADFTA evaluating Link 22 for DHFCS**
  - Uses DHFCS and sea/land platforms of opportunity
  - Outcome is design concept for Link 22 implementation
- **Integration of Link 22 with DHFCS**
  - No new systems on platforms or fixed network
  - Low cost
  - High operational value
  - Highly capable tactical datalink facility