

Unmanned Aircraft Systems for Southern Company

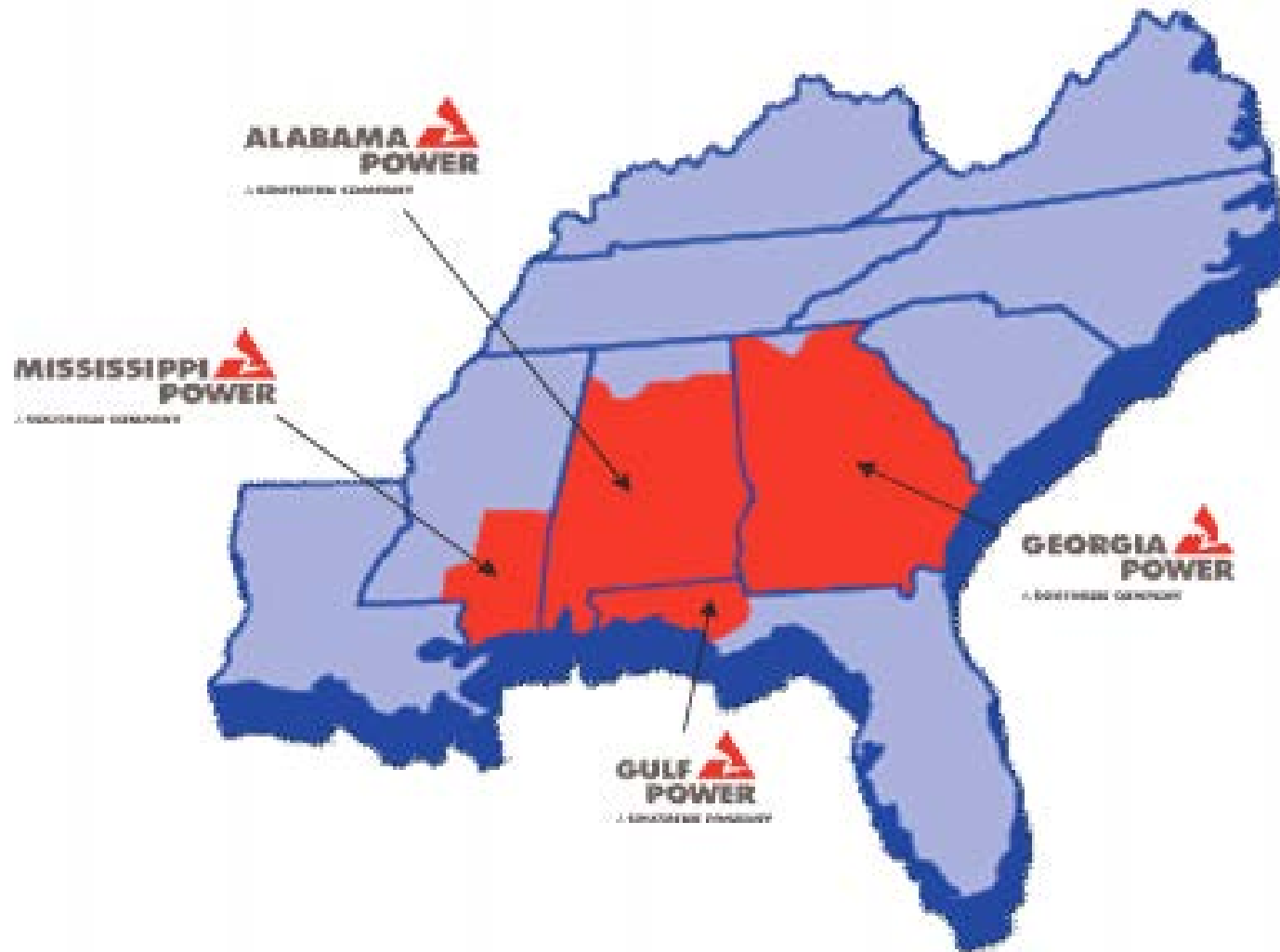
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R&D
Research & Development

SOUTHERN
COMPANY

About Southern Company



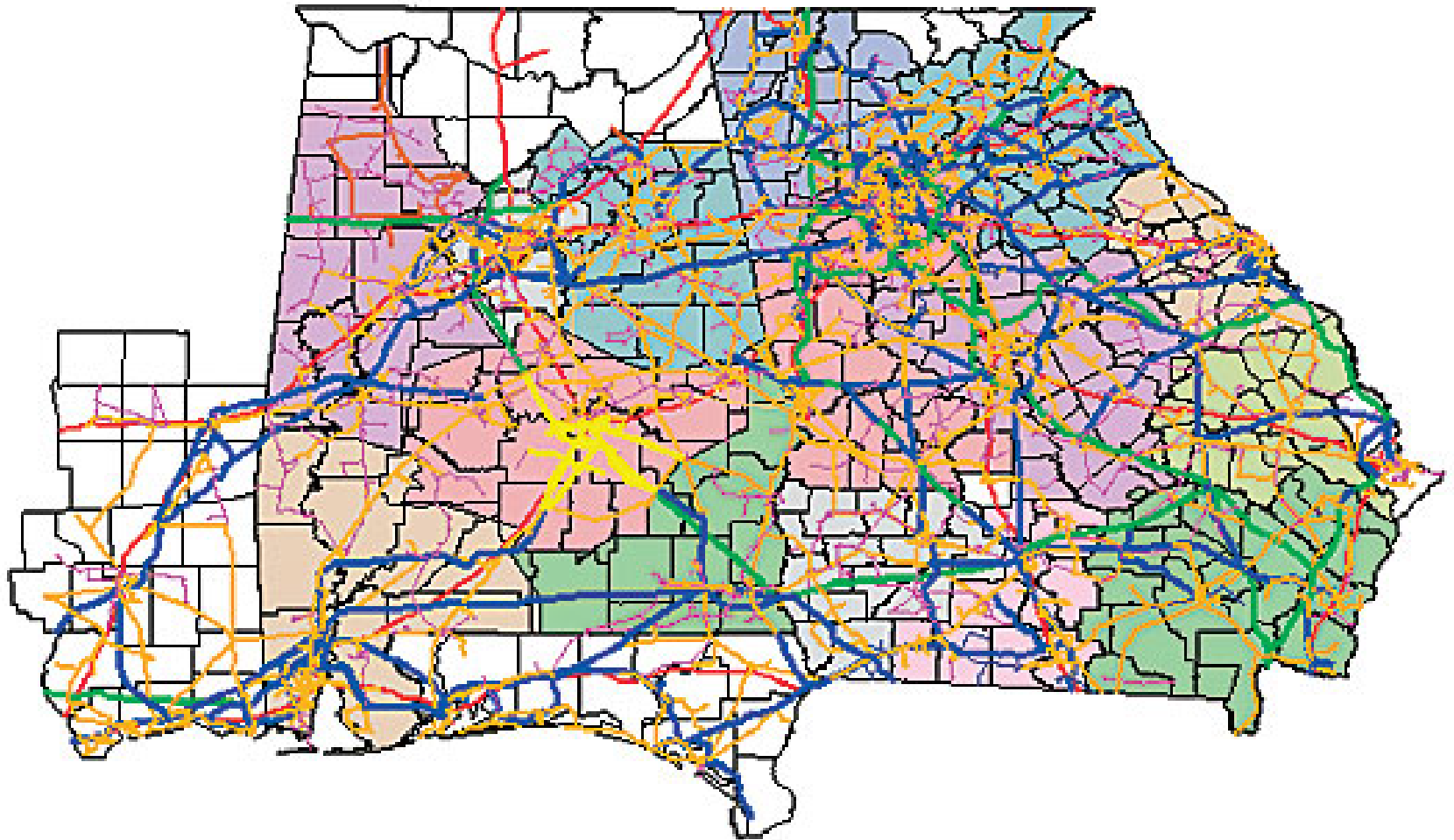
Generation



Transmission



Transmission System



Distribution



What are UAS?

- Unmanned Aircraft – Aircraft flown by an operator via ground control system or autonomously through on-board systems.



Project Overview

Accelerate the adoption and integration of UAS for Southern Company

Value

- **Safety, Savings, and Improved Reliability**
- Manned aircraft aerial inspections are expensive
- The UAS of **today** can operate at a fraction of the cost

Vision

- Validated UAS utility business cases
- Central coordination, compliance, and management
- Leverage both internal and external workforce



Southern Company UAS Activities

Executing Integration Strategy

Working with the FAA

Working with Industry

Working with Research Groups

Collaborating with Regulators

Performing Demonstrations

Developing the Business Case



What is Southern's interest?

Ex. Transmission Patrols



Transmission Patrol Comparison



Manned



Un-Manned

Ex. Comprehensive Aerial Inspections



Comprehensive Aerial Inspection Comparison



Manned



Un-Manned

Volume Calculations/Removal



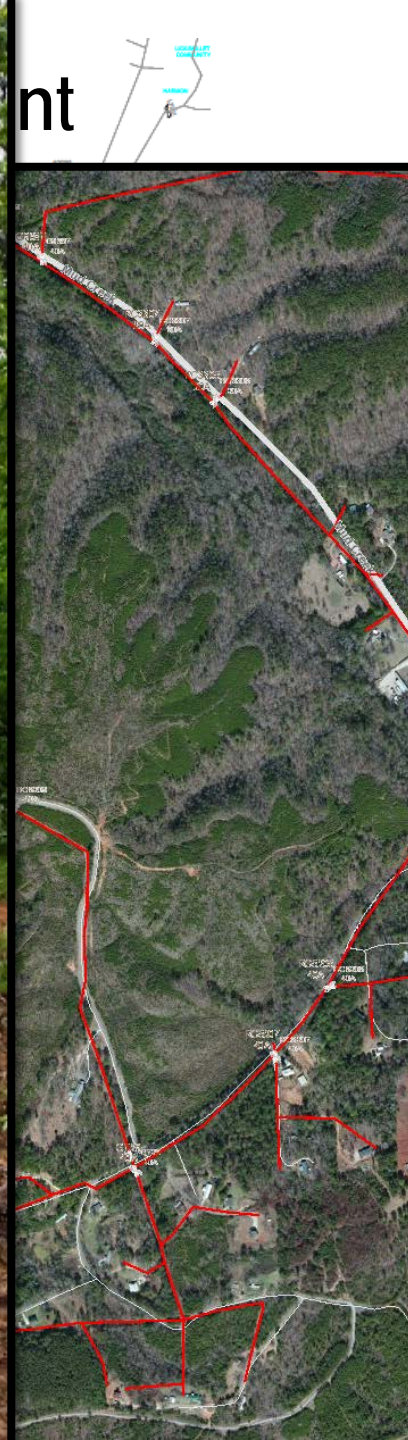
What is Southern's interest?

Retool

- Coal Pile Survey
- Fixed Wing Transmission
- Comprehensive Aerial
- Transmission Storm Assessment

Storm Damage Assessment





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RoW Issues



Vegetation Management



What is Southern's interest?

Retool

- Coal Pile Survey
- Fixed Wing Transmission
- Comprehensive Aerial
- Transmission Storm Assessment

Reinvent

- Distribution Storm Assessment
- Shoreline Inspection
- Vegetation Management
- GIS Cleanup

What are the State of the Regulations?

- Public, Civil, and Recreational UAS
- Civil
 - Approval on application basis
 - Heavily restricted (28+ restrictions)
 - COA, Pilot License, Medical Certificate, 24 Hour Notification, Aircraft Specific, Visual Observer, Aircraft less than 55lbs
 - 200' AGL Blanket Ceiling
 - Day time only & Line-of-sight only



FAA will Crawl, Walk, Run



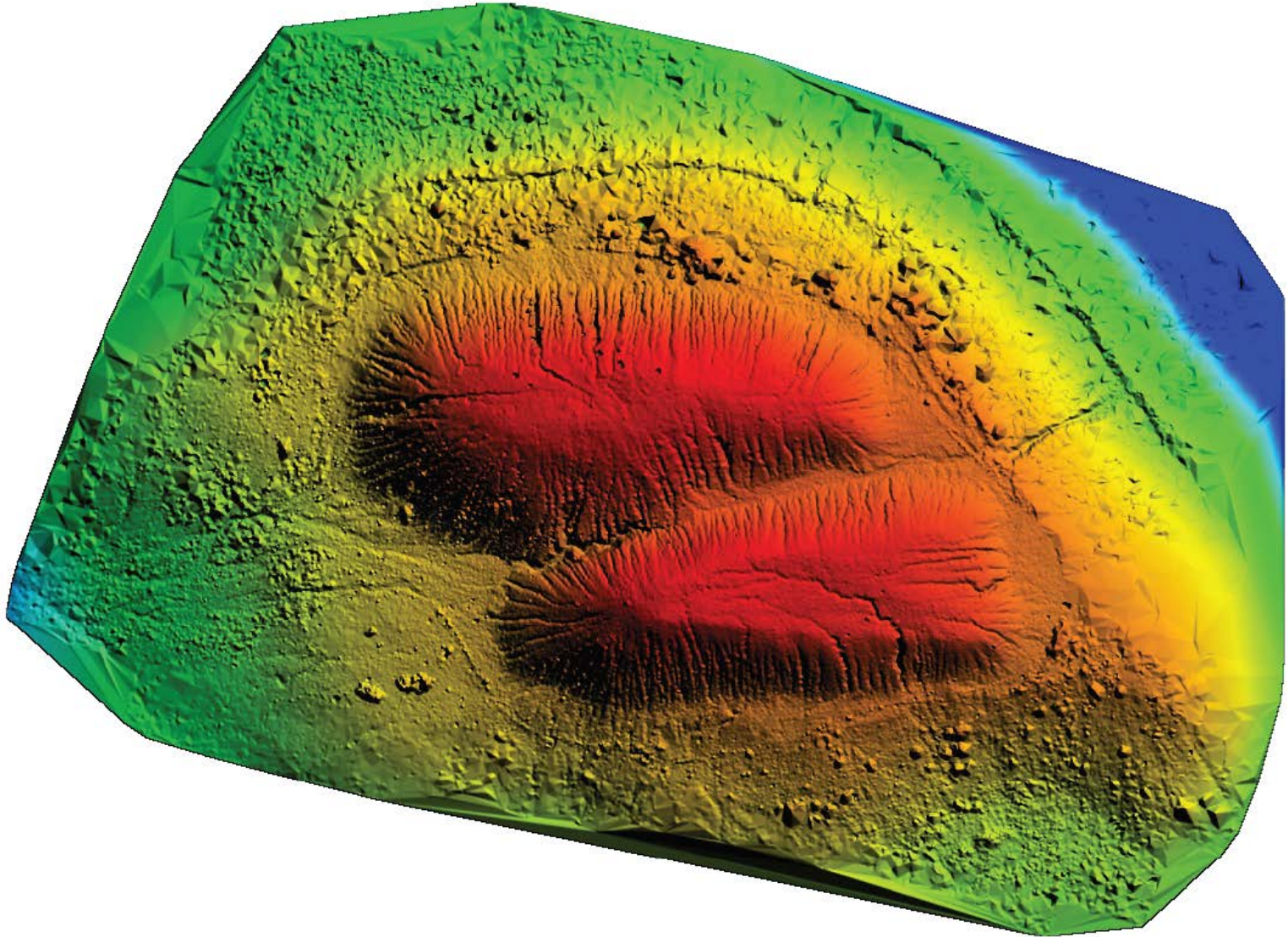
Lessons Learned



Ex. of “immediate value” use case – local vertical infrastructure



Ex. of “immediate value” use case – volumetric coal pile surveys



Ex. of “Immediate Value” Use Case – Local Mapping Applications



Ex. of “Immediate Value” Use Case – Local Aerial Photography



What's next? sUAS Final Rule

"Micro-Class" (μ UAS)



- Up to 4.4 lbs (2 kg)
- Self-Certified
- No FPV or Autonomy
- Class G Airspace Only
- Greater than 5 miles of an airport
- 400 ft Max Altitude
- Can Operate over People

"Small UAS" sUAS



- Up to 55 lbs
- Pass Knowledge Test
- FPV & Autonomy Allowed
- Allowed within other Airspace Classes and Closer to Airports
- 500 ft Max Altitude
- Prohibits Flying Over People not Involved in Operations

Not expected Final Rule until Summer 2016

What's next for 2016 and beyond?

Near

- Approved, but Constricted
- Limited Use Cases
- Limited Value

Mid

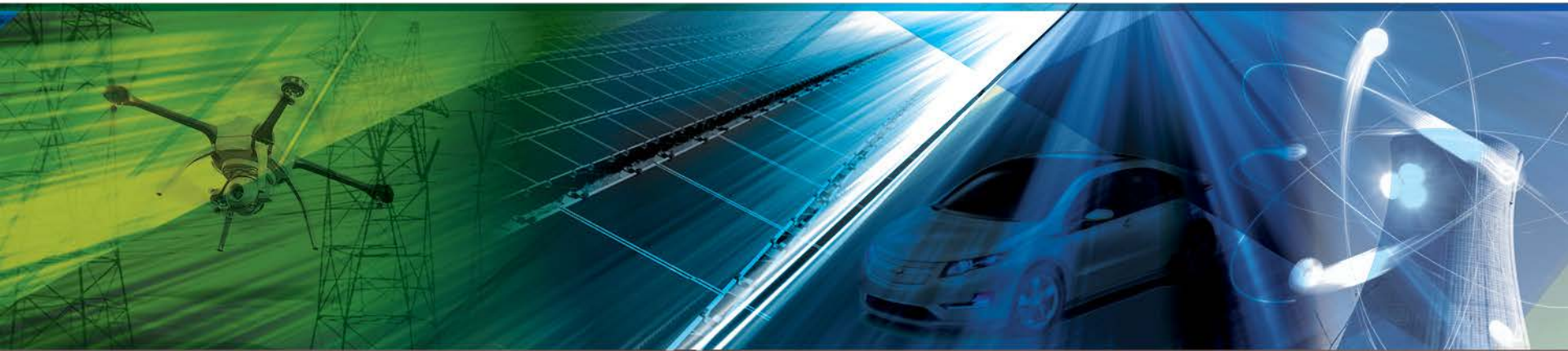
- Final Rule for sUAS
- Standard Procedures
- BVLOS Approval Case-by-case
- Integration Plan

Long

- Autonomous
- High Altitude
- Real-time
- Custom Payloads
- Beyond Visual Line of Sight

Questions?

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