

SECTION A. Project Title: 5G Network

SECTION B. Project Description and Purpose:

The Idaho National Laboratory (INL) Wireless Test Bed (WTB) will acquire and build a converged Fifth Cellular Generation (5G) Non-Stand Alone (NSA) and 5G Stand Alone (SA) network from a commercial grade vendor, based on the 3GPP standard. The cellular equipment, including Core and the Open Radio Access Network (O-RAN) will be racked within Gate 1, Shelter 3. Also, cellular radios will be mounted on an existing mobile WTB Communications-On-Wheels (COW) tower near the Security Training Facility (STF) and on the existing WTB tower known as Cell Site #9, near the Critical Infrastructure Test Range Complex. Also, a small cellular radio unit will be wall-mounted in Network Operations Center (NOC)-4 in the Engineering Research Office Building (EROB) building. Figure 1 displays the 5G Network architecture and indicates geographic locations of major components.

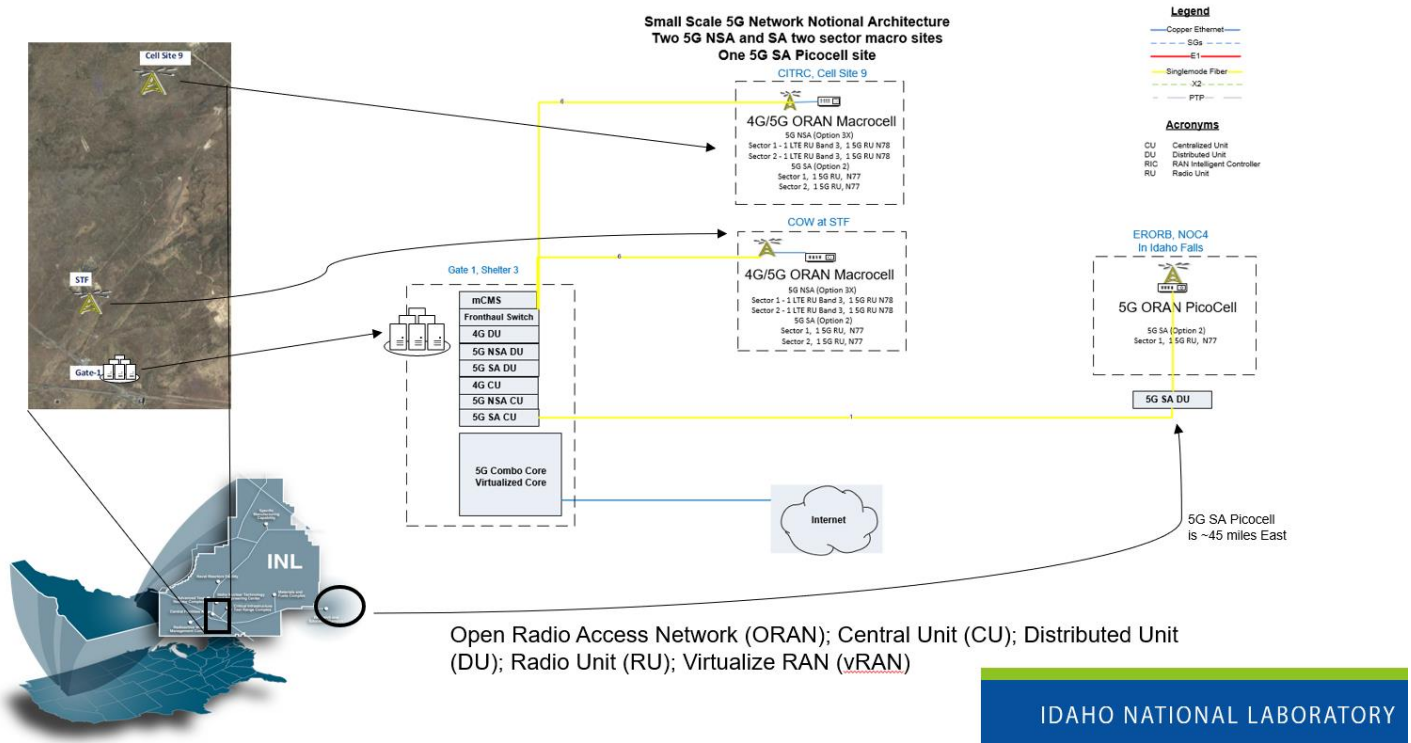


Figure 1 – 5G Network Architecture on Geographic Overlay

These 5G Network elements will be connected by a switch to the Network Operations Centers (NOC) located at other INL facilities: EROB, CFA-699, and CFA-1609. The NOCs are locations where technicians and customers can monitor testing events. The switch will also have a server located in EROB-106 that supports the small cellular radio within NOC-4. Transport between Gate 1, Shelter 3, and other 5G Network facility locations will utilize existing WTB & INL fiber networks.

Some facility upgrades will be required at: Gate 1, Shelter 3; STF; and Cell Site #9. The required facility modifications are defined below:

- Gate 1, Shelter 3 will require an additional 6.88 tons of cooling to accommodate installation of the Core and O-RAN network elements, and supporting peripherals (including 30 servers). To accomplish this, the four (4) existing 5-ton heating, ventilation, and air conditioning (HVAC) units will be removed and replaced by four (4) new 6-ton HVAC units. This upgrade and the various 5G Network servers and switches consequently require upgrades to breakers, wire size and conduit sizes. Also, DC rectifiers will be required to support the additional 504 Amps of 48 volts DC. An additional battery bank will be required with an additional 400 Amp fuse in parallel with the current battery bank, to take the load during a power outage.
- 5G COW must be stationed at a safe operating distance from the existing power pole to which is mounted the STF fiber drop and bang board (top of Figure 10). Therefore, an additional bang board (and >100' of conduit for fiber and electrical cables) will be installed adjacent to the existing pad depicted at center, bottom of Figure 2. Trenching for the >100' conduit will follow the blue line shown in Figure 2. This will involve cutting the pavement and then repaving after conduit is laid. Also, 3 or 4 guy wire anchors (to steady the top of the tower against wind) will be distributed evenly around the red circle shown.



Figure 2 - 5G Network Required Facility Mods to Deploy 5G COW at INL STF

- Cell Site #9 will require a permanent power connection from nearby existing bangboard to the shelter (see power pole on right side of Figure 3). The conduit for the power cable will be run above ground, between 2 cement barriers which will run directly from the power pole to the shelter (at center of Figure 3). Also, 3 new 220-volt outlets will be needed inside the shelter.

Old equipment, such as the HVAC units, will be excessed.



Figure 3 - 5G Network Required Facility Mods at INL Cell Site #9

SECTION C. Environmental Aspects or Potential Sources of Impact:

Air Emissions

Equipment used for trenching and paving will generate air emissions from consuming fuel and may generate possible fugitive emissions as dust.

Discharging to Surface-, Storm-, or Ground Water

N/A

Disturbing Cultural or Biological Resources

Project activities performed between April 1 and October 1 have the potential to impact nesting birds. Threats include, but are not limited to: noise, vegetation removal, human activity around nests, lighting, etc. If warranted, a work activity could be postponed, moved, or other restrictions could be developed to protect active migratory bird nests.

Activities may involve soil disturbance. The CERCLA Technical point of Contact should be contacted to assist with any activities being performed inside a CERCLA Institutional Control Area.

Generating and Managing Waste

This work is expected to generate small amounts of common trash and construction-related waste such as scrap metal (wire, conduit, etc.). All scrap metal will be recycled. some packaging material is also anticipated. All old equipment will be excessed.

to the extent practicable.

Releasing Contaminants

Although not anticipated, there is a potential for spills when using chemicals or fueling equipment.

DOE-ID NEPA CX DETERMINATION

Idaho National Laboratory

Using, Reusing, and Conserving Natural Resources

INL is committed to protecting the environment and human health. INL aims to comply with environmental laws, regulations, and other requirements that protect the air, water, land, and natural, archeological, and cultural resources potentially affected by routine activities. INL employs the environmental management system (EMS) modeled by the International Organization for Standardization (ISO) Standard 14001 to establish policy, objectives, and targets to reduce environmental impacts and increase operating efficiency through a continuing cycle of planning, implementing, evaluating, and improving processes. The INL Site Sustainability program implements strategies and practices that meet key DOE sustainability goals, including decreasing water use intensity; increasing diversion of construction and demolition waste from the landfill; and reducing greenhouse gas (GHG) emissions.

INL reuses or recycles all materials where economically practicable. INL also diverts all applicable waste from disposal in the landfill where conditions allow. INL practices sustainable acquisition.

SECTION D. Determine Recommended Level of Environmental Review, Identify Reference(s), and State Justification: Identify the applicable categorical exclusion from 10 Code of Federal Regulation (CFR) 1021, Appendix B, give the appropriate justification, and the approval date.

For Categorical Exclusions (CXs), the proposed action must not: (1) threaten a violation of applicable statutory, regulatory, or permit requirements for environmental, safety, and health, or similar requirements of Department of Energy (DOE) or Executive Orders; (2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment or facilities; (3) disturb hazardous substances, pollutants, contaminants, or Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)-excluded petroleum and natural gas products that pre-exist in the environment such that there would be uncontrolled or unpermitted releases; (4) have the potential to cause significant impacts on environmentally sensitive resources (see 10 CFR 1021). In addition, no extraordinary circumstances related to the proposal exist that would affect the significance of the action. In addition, the action is not "connected" to other action actions (40 CFR 1508.25(a)(1) and is not related to other actions with individually insignificant but cumulatively significant impacts (40 CFR 1608.27(b)(7)).

References:

10 CFR 1021, Appendix B to Subpart D, B1.7 "Electronic equipment," B1.31 "Installation or relocation of machinery and equipment," and "B1.19 Microwave, meteorological, and radio towers."

Justification:

Project activities are consistent with 10 CFR 1021, Appendix B to Subpart D, B1.7 "Acquisition, installation, operation, modification, and removal of electricity transmission control and monitoring devices for grid demand and response, communication systems, data processing equipment, and similar electronic equipment" and

B1.31 "Installation or relocation and operation of machinery and equipment (including, but not limited to, laboratory equipment, electronic hardware, manufacturing machinery, maintenance equipment, and health and safety equipment), provided that uses of the installed or relocated items are consistent with the general missions of the receiving structure. Covered actions include modifications to an existing building, within or contiguous to a previously disturbed or developed area, that are necessary for equipment installation and relocation. Such modifications would not appreciably increase the footprint or height of the existing building or have the potential to cause significant changes to the type and magnitude of environmental impacts."

B1.19 "Siting, construction, modification, operation, and removal of microwave, radio communication, and meteorological towers and associated facilities, provided that the towers and associated facilities would not be in a governmentally designated scenic area (see B(4)(iv) of this appendix) unless otherwise authorized by the appropriate governmental entity."

Is the project funded by the American Recovery and Reinvestment Act of 2009 (Recovery Act) Yes No

Approved by Jason Anderson, DOE-ID NEPA Compliance Officer on: 04/06/2021