

**Building Strong®**

**DISCOVER | DEVELOP | DELIVER**

## US Army Corps of Engineers Reachback Operations Center (UROC)

### Providing Relevant Solutions to the Armed Forces and the Nation

The USACE Reachback Operations Center (UROC) at the U.S. Army Engineer Research and Development Center (ERDC) provides a “reachback” engineering capability to support contingencies across the full operational and natural disaster spectrum. The UROC rapidly leverages the Corps’ extensive resources to support deployed forces or those requiring specialized assistance.

Deployed troops are linked to subject matter experts (SMEs) within the U.S. Army Corps of Engineers, government, private industry, or academia to obtain solutions to complex problems. Personnel may contact the UROC for reachback support using the UROC’s Reachback Engineer Data Integration (REDi) website, phone, email, or UROC’s satellite-based TeleEngineering Communications Equipment.

### Engineering Expertise

Common topics of requests for information (RFIs) include:

- Bridge Assessment
- Airfield Design and Repair
- Dam Breach and Hydrology Analysis
- Trafficability (On or Off Road)
- Geophysical Environment Analysis Climate Information and Analysis
- Force Protection / Survivability
- Bomb Damage Assessment
- Critical Infrastructure Assessment
- Base Camp Development
- Engineering, Master Planning and Facilities
- Construction and Mapping

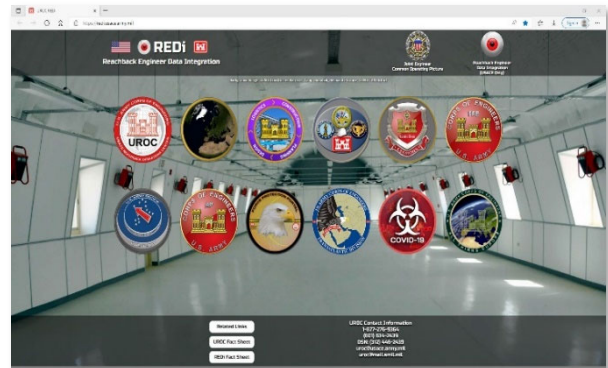
### Innovative Development

UROC has designed Field Force Engineering tools to enhance the capabilities available to DoD forces.

- **The Automated Route Reconnaissance Kit (ARRK):** Incorporates GPS, video, and inertial measurement unit providing automated data collection capability for on-the-move reconnaissance for both ground and airborne platforms. Numerous operations and natural disaster response missions have been supported.
- **TeleEngineering Communications Equipment-Deployable (TCE-D):** Provides assured reachback by leveraging commercial-off-the-shelf technology in a UROC integrated solution for internet or telephone access, secure and non secure VTC functionality and data transfer. The system is a critical component when other communications infrastructure is unavailable.
- **Reachback Engineer Data Integration (REDi):** Website provides a common database, mapping tool and robust user interface for submitting, managing, tracking and archiving all data and reachback support managed through the UROC related to the engineer reachback process and the Field Force Engineering program.



Engineers with problems beyond their capability to solve with in-theater resources are connected with SMEs via reachback through the UROC.

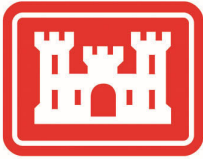


REDi is a single user interface through which data sources, services and tools provided by the UROC may be accessed and managed.

**Contact 601-634-2439 / DSN 312-226-1051**

[uroc@usace.army.mil](mailto:uroc@usace.army.mil) / [uroc@mail.smil.mil](mailto:uroc@mail.smil.mil) / <https://uroc.usace.army.mil> / <https://redi.uroc.army.smil.mil>

The U.S. Army Engineer Research and Development Center (ERDC) solves the nation’s toughest engineering and environmental challenges. ERDC develops innovative solutions in civil and military engineering, geospatial sciences, water resources, and environmental sciences for the Army, DOD, civilian agencies, and our Nation’s public good. Find out more on our website: [www.erdcd.usace.army.mil](http://www.erdcd.usace.army.mil). Approved for public release; distribution is unlimited. June 2018.



**ERDC**  
ENGINEER RESEARCH & DEVELOPMENT CENTER

**Building Strong®**

**DISCOVER | DEVELOP | DELIVER**

## Reachback Engineer Data Integration (REDi)

### Reachback Data Management

The Reachback Engineer Data Integration (REDi) system provides a common database, robust user interface and fully integrated mapping tools for receiving, managing, tracking, and archiving engineering reachback, project and infrastructure related data. REDi was initially developed to support the reachback engineer data management requirements of the USACE Reachback Operations Center (UROC) involving many thousands of requests for information (RFI) that the UROC receives and manages annually. The system has since expanded and is currently used by the US SOUTHCOM J45 Engineer Division, US Army Pacific ACSENG, USACE Transatlantic Division, USACE Northwestern Division, USACE G2, the USACE Field Force Engineering program, and others. The REDi system is replicated on the unclassified, CENTRIXS-K and SIPR networks.

### System Features

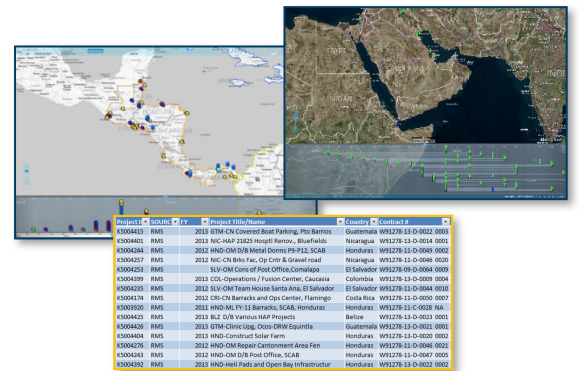
REDi is developed within the SharePoint environment and couples the wide array of standard SharePoint features with custom-designed tools to provide a versatile web-based application including alerts, automated email functions, custom form creation and many other capabilities. Access to REDi on the unclassified network is available for Department of Defense (DoD) Common Access Card (CAC) holders, and a multilevel permission structure provides flexibility for various user groups. The REDi interface provides search and query tools for consolidated viewing, managing, and tracking of construction projects and status, engineering reachback data, emergency management, intelligence reporting, and other information relevant to the engineer missions. Fully integrated mapping tools allow for data to be spatially located and data from external sources such as USACE project databases (RMS, P2) are merged to provide a complete picture of engineer-related activities.

### Custom Portal Development and Support

The components of the REDi system are easily adapted to meet data management requirements for a variety of engineer missions. To date, the UROC has developed custom portals within the REDi architecture for the USACE G2, USACE Field Force Engineering Program, USACE Transatlantic Division, CENTCOM J4 Engineers, USARPAC ACSENG, Army Facilities Components System, and others. Custom features, tools, permissions, and site layout are provided for each portal while taking advantage of a single common overall hardware and software system architecture. The UROC provides full system and customer support, data backups, replication to SIPR network as requested, and ensures compliance with applicable network and information assurance requirements and policies.



**REDi Web Portal – Access requires DoD CAC**



**Fully integrated mapping tools for engineering data**

**Contact: 601-634-2439 / DSN 312-226-1051**

**[uroc@usace.army.mil](mailto:uroc@usace.army.mil) / [uroc@mail.smil.mil](mailto:uroc@mail.smil.mil) / <https://redi.usace.army.mil>**

The U.S. Army Engineer Research and Development Center (ERDC) solves the nation's toughest engineering and environmental challenges. ERDC develops innovative solutions in civil and military engineering, geospatial sciences, water resources, and environmental sciences for the Army, DOD, civilian agencies, and our Nation's public good. Find out more on our website: [www.erd.usace.army.mil](http://www.erd.usace.army.mil).

Approved for public release, distribution is unlimited. September 2016.



**US Army Corps  
of Engineers®**



**ERDC**  
ENGINEER RESEARCH & DEVELOPMENT CENTER

**Building Strong®**

**DISCOVER | DEVELOP | DELIVER**

## Automated Route Reconnaissance Kit (ARRK)

### Compact and Flexible – ARRK 5

The U.S. Army Corps of Engineers (USACE) Reachback Operations Center (UROC) has developed the next generation in Automated Route Reconnaissance capabilities. Smaller and less complicated with fewer wires than previous versions of the ARRK, ARRK 5 provides a new, simple to use plug and play platform to rapidly execute mounted reconnaissance to support a wide range of contingency related assessments. Compared to traditional route reconnaissance techniques, soldiers and first responders can reduce time, minimize security risks, and acquire quantitative data sets in order for commanders and stakeholders to make informed decisions.



**ARRK5 combines the power of an interactive touch screen computer with a headset, GPS, and a high-resolution digital camera.**

### Engineer Support to Information Collection and Reconnaissance

The ARRK can support numerous Combat Engineer and General Engineering Reconnaissance tasks. Examples include:

- Traditional Route Reconnaissance
- Pre-deployment Site Surveys
- Route Clearance
- Route Familiarization
- Trafficability Studies
- Convoy/ Maneuver Planning
- Aerial Assessments
- Port Assessments
- Pre-Post Natural Disaster Assessments
- Road Construction Planning (Rough Order of Magnitude)



**ARRK has been repeatedly used in both civilian and military aircraft. ARRK 5 will continue to support the use of a high resolution DSLR camera and precision navigation sensors to provide geospatial image referencing.**

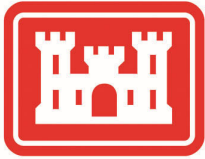
### Easy to Operate and Process Data

During a recon, photos, voice annotations and location are collected. Instead of relying on inertial sensor data which can be influenced by operator and driver behavior, ARRK 5 optimizes the use GPS data which is filtered using an innovative mathematical algorithm to analyze and compute slope and radius of curvature. Compared to previous versions of the ARRK, ARRK 5 produces windshield view photographs with 4 times the resolution of previously captured images. Route features such as bridges, intersections, obstructions and constrictions, can be added using the computer touchscreen. An operator with minimal training can collect, process and export route information. Once a recon is completed, operators may instantly view a chronological replay of pictures captured along the route, including a geo-referenced display of key features. Data can quickly be exported to an elevation profile, movie clip, shapefile and pre-formatted reconnaissance reports in accordance with ATP 3-34.81, Engineer Reconnaissance. The KMZ export feature provides the ability to share appropriate route information and pictures within Google Earth and other standard GIS platforms for easy and versatile data sharing and dissemination. Data may also be uploaded into the UROC Reachback Engineer Data Integration (REDi) system for online data sharing and archiving purposes.

**Contact 601-634-2439 / DSN 312-226-1051 [uroc@usace.army.mil](mailto:uroc@usace.army.mil) / [uroc@mail.smil.mil](mailto:uroc@mail.smil.mil) / <https://uroc.usace.army.mil>**

The U.S. Army Engineer Research and Development Center (ERDC) solves the nation's toughest engineering and environmental challenges. ERDC develops innovative solutions in civil and military engineering, geospatial sciences, water resources, and environmental sciences for the Army, DOD, civilian agencies, and our Nation's public good. Find out more on our website: [www.erd.usace.army.mil](http://www.erd.usace.army.mil). Approved for public release; distribution is unlimited. June 2018.





**Building Strong®**

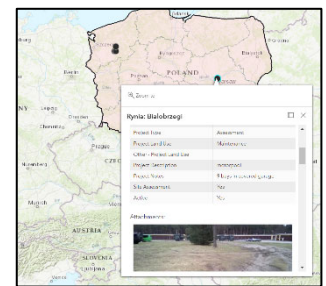
**DISCOVER | DEVELOP | DELIVER**

## IRIS Survey123

### Description

The U.S. Army Corps of Engineers (USACE) Reachback Operations Center (UROC) provides a rapid field data solution utilizing a suite of software applications, designed by the Environmental Systems Research Institute (esri). Field surveys are principally created and digitally accreted using the ArcGIS Survey123 Connect and ArcGIS Survey123 mobile applications respectively. The applications are accessed using either a Panasonic CF-33 Toughbook with internal SmartCard Reader, or US government-issued mobile phone (Android or iOS) with Purebred, DISA's PKI Engineering mobile application to provide a secure, scalable method of distributing software certificates for DoD PKI subscribers' use on commercial mobile devices. Together, the field applications and hardware form a complete form-centric solution for creating, sharing, and analyzing rapid field collections, or SWEAT-MSO/ASCOPE infrastructure field surveys.

Field collections are hosted on the USACE Joint Engineer Common Operational Picture (JECOP) ArcPortal, where those data are replicated to the UROC's Reachback Engineer Data Integration (REDi) One Engineer Vision (OEV) online map, enabling field workers and stakeholders the ability to easily gather, visualize, aggregate, and analyze those data, while ensuring secure upload, storage, and export of that information.



### Capabilities

Through the Survey123 mobile field application, users can capture high resolution photos, dictate notes and audio recordings, and attach sketches associated with POIs. In addition to basic field data (photos, notes, etc.), custom forms are available for SWEAT-MSO/ASCOPE infrastructure field surveys. The collected data is bundled into a geolocated assessment point icon via the on-board GPS from the CF-33 or mobile phone. Once the field data is collected and sent to the JECOP ArcPortal, it can be utilized locally to extract information and generate reports, or it can be synchronized to the geo-database through the UROC's REDi portal to be stored and shared. Through the synchronization process, the UROC passes data collection and any IRIS software upgrades to the end user.

### Benefits

The UROC can provide site-specific AOI offline maps or imagery and standardized data collection forms, such as on-site Environmental Condition Reports, for deploying units without mobile internet access. In addition, the UROC maintains a data repository for all collected data, as well as software updates. The UROC performs data migration from the unclassified network to the SIPR network to allow for further analysis and interoperability among various national databases, as needed.

**Contact** 601-634-2439 / DSN 312-226-1051

[uroc@usace.army.mil](mailto:uroc@usace.army.mil) / [uroc@mail.smil.mil](mailto:uroc@mail.smil.mil) / <https://uroc.usace.army.mil>

The U.S. Army Engineer Research and Development Center (ERDC) solves the nation's toughest engineering and environmental challenges. ERDC develops innovative solutions in civil and military engineering, geospatial sciences, water resources, and environmental sciences for the Army, DOD, civilian agencies, and our Nation's public good. Find out more on our website: [www.erdcd.usace.army.mil](http://www.erdcd.usace.army.mil).  
Approved for public release; distribution is unlimited. June 2018.



**Building Strong®**

**DISCOVER | DEVELOP DELIVER**

## TeleEngineering Communications Equipment (TCE)

### Assured Reachback Communications

TeleEngineering Communications Equipment (TCE) provides secure and non-secure communications capabilities, linking deployed USACE personnel, their higher headquarters, engineer units and subject matter experts (SMEs) to meet mission objectives. USACE personnel and engineer units often deploy to areas where the communications infrastructure is unreliable or nonexistent. To overcome this deficiency, the U.S. Army Engineer Research and Development Center (ERDC) developed a satellite-based system to allow deployed personnel the capability to send and receive data and to conduct video teleconferences (VTCs) in a secure or non-secure manner. The deployable system is known as the TCE-D.

### Portable, Secure, Flexible, & Reliable

TCE-D components are packaged in two wheeled pelican cases for easy handling. If Type 1 encryption is required, a third smaller size case is used. The encryptor provides NSA-approved Type 1 encryption, ensuring deployed personnel can securely send and receive classified information and correspond with colleagues and SMEs.

Three geosynchronous satellites provide virtually global coverage, enabling deployed personnel to make phone calls, access the internet, send and receive data, and conduct video conferences (VTCs) in a secure or non-secure manner.

- Wide range of transports supported (satellite, IP, ISDN, etc.)
- Image Capture/Broadcast (PowerPoint, document camera, camcorder, DVD, computer display, etc.)
- Modified COTS equipment for wide range of operating voltage
- Powered through available AC power or DC vehicle power
- Link Redundancy (VTC and Data links employ separate processors)
- Auxiliary video inputs, store and forward video
- UROC supports multiple users in concurrent calls (30-50 nodes)

### Specialized resources supporting the entire Engineer Regiment

- Capability is doctrinally referenced in FM 3-34, "Engineer Operations"; Army G4 assigned NSLIN-FA9577
- Bridging resources certified & accredited with Army CIO/G6 Army, Cybersecurity Directorate, and with DISA, Defense Video Services
- Provides deployed users low bandwidth access to high bandwidth DoD video networks
- Over 275 deployable kits fielded since inception (1999)
- UROC hosts 40 - 50 VTCs per week

**Contact 601-634-2439 / DSN 312-226-1051**

[uroc@usace.army.mil](mailto:uroc@usace.army.mil) / [uroc@mail.smil.mil](mailto:uroc@mail.smil.mil) / <https://uroc.usace.army.mil>



**Field personnel use satellite technology to provide telephone, internet or VTC to leverage SMEs for engineering solutions.**



**TCE-D allows engineers in the field to communicate to SME from any area of operation**