OVERVIEW

During Level 1, 2, and 3 situations, public utilities such as electricity, natural gas, and water will be critical to the response, mitigation, and recovery initiated by the University of Arizona.

Extended interruptions of any one of these three (3) utilities will have an adverse affect on the university. During these times Facilities Management and Risk Management and Safety will have critical roles in advising UACERT as to issues associated with the university’s ability to operate.

During conversations with Deans, Directors and Department Heads it was made abundantly clear that the cyber age is a major portion of the essential tasks of most units are intricately tied to and dependent on computers, network connectivity and communications. This includes classroom instruction research projects, administrative processing and related activities, and environment control requirements. The activities of the units of most interviewees were so dependent on computers that some remarked “take away my computers and I am sending everybody home”.

Although the facts indicate the importance of electricity to UA mission accomplishment, the other utilities water and natural gas, are also critical to research, food preparation, plumbing and sanitation.

ELECTRICAL POWER, GAS and WATER

Electrical Power

The common element in the foregoing dependencies is electrical power. Examples of the impact of being without electricity are: there would be no lighting in classrooms, laboratories, residence halls, libraries and other facilities; instructional aids will not work; laboratory and research equipment will not work; the computer screens, storage and retrieval systems and fax and copy machines cannot be used; digital telephones are not operable after being without electricity for 45 minutes; the air conditioning in buildings ceases, which not only increases the discomfort level in occupied facilities but also jeopardizes some of our most valued collections in campus museums; the KUAT UA channel with direct cable lines to residence halls cannot be used in emergencies to communicate with students because if TEP provided electricity is lost UA generated
electricity currently cannot be linked to the KUAT capability and there is no in place or assigned emergency backup generator.

The loss of electrical power of more than ***** hours also creates a cascading effect as the electrical loss creates issues with plumbing, especially in the multi-level buildings.

The colleges that are heavily engaged in research activities are highly reliant on electricity to store and manipulate data and in some cases maintain specified temperature control for testing, experimentation and storage of refrigerated or frozen samples. One college dean said “If I do not have electricity at certain research locations within one hour after a disaster a lot of money will be lost”. For example, the thawing of contents in certain -80 degree freezers on campus could result in the loss of millions of dollars of research materials. There are literally hundreds of refrigerators, -20 degree freezers, incubators and growth chambers in which research/biological materials will begin to deteriorate if left unpowered more than 12 hours.

The concern is lessened somewhat by the existence and use of emergency generators. However, currently, at the UA there are (Removed for Security) emergency generators including (Removed for Security) spares (Removed for Security). A listing showing locations and types of generators can be found at the end of this chapter.

The purpose of an emergency generator is to only provide for the functioning of services that protect life and property e.g. “EXIT” signs, lights and critical equipment. They are not intended to duplicate normal electrical operational capabilities. Since the University is heavily engaged in research activities all of the facilities where major research projects are undertaken and those where large concentration of people frequent, either included emergency generators during their design or were added after the fact, based on need.

**ELECTRICAL**

Electricity is the first of three (3) prime resources that is a significant factor in the ability to continue academic operations after an extended major campus emergency.

**UA Power Source – Tucson Election Power**

The UA electrical power routinely is provided by Tucson Electric Power (TEP). The Pima County area uses approximately **** megawatts of power daily. The UA-supplied portion of that is approximately *** megawatts.

TEP managers who work the electrical control aspects of the area-wide power provision responsibility indicate that, in a worse-case scenario, the entire TEP service area could
be without electricity (Removed for Security). However, in order for such a power outage to materialize, a well contrived plan resulting in serious damage to multiple power generating stations throughout southern Arizona would need to occur.

**TEP Power Interruption at UA**

When a power outage occurs at the UA the Facilities Management will implement their emergency procedures.

If the electrical generating station supplying the UA with power is nullified for any reason, TEP indicates that a mobile generating unit would be moved in to replace the ineffective power station. TEP believes that it has the area redundancy; mobile transformers/equipment; multiple sources within and outside from which to purchase electricity; and an automated load leveling capability to balance the electrical needs of its customers area-wide. Additionally, TEP has a unit called Control, Area Operation, which devotes time to war-gaming a variety of situations that could occur that are hostile to their mission. The war-game methodology is used to develop solutions to problems and accelerate responses to problems.

In conjunction with TEP this capability provides a high probability that the UA will have access to the electricity needed to minimize disruptions in academic operations from an extended power outage. The power generated by the UA and individual building generators provide enough power to accommodate approximately 75 percent of UA daily requirements.

Therefore, through a prioritization scheme that, for the most part, can be implemented remotely, and a Purchasing Department generator fuel procurement plan, there is an extremely high probability that UA high priority requirements will be satisfied.

Emergency contact telephone numbers for **Tucson Electric Power** are: Removed for Security Reasons

UA colleges and support units are required annually to provide a list of facilities with extraordinary requirements or impacts if electrical power is not received within 1-24 hours, 25-48 hours, and 49-72 hours. This list shall be updated and prioritized annually for use in emergency situations when electricity from TEP is not available and UA need is not being met. The annually established priorities may be changed by the UACERT or the UA official managing the incident.

**GAS**
Gas provides for heating for UA facilities. It also assists with the cooling function by fueling the turbines that produce electricity to run a portion of Campus Chillers and Emergency Generators. While heating and cooling, for obvious creature comfort reasons, are of seasonal importance to the conduct of the overall mission, there are certain elements/unit, the arts, museums and research where environmental control and/or refrigeration are continuing essential requirements for mission accomplishment.

Natural gas is the second of three (3) prime resources that are significant factors in the ability to continue academic operations after an extended major campus emergency.

**Emergency Notification**

**UAPD Notification**

In most situations UAPD will be the first notification of natural gas situations. In these cases UAPD Dispatch will make notification to Southwest Gas of the problem. In most cases UAPD will respond to assist with traffic and pedestrian control.

Facilities Management will be notified by UAPD of the issue. Depending on the type of incident, Facilities Management may be asked to respond to assist. Facilities Management provides institutional knowledge and has building plans if necessary.

**Facilities Management Notification**

If Facilities Management is notified of a natural gas incident, it will contact UAPD and advise UAPD dispatch of the situation.

**Supply Source – Southwest Gas Company**
Gas support to the UA is provided in its entirety by Southwest Gas Corporation. It is used to fuel laboratories, equipment for research and instruction, boilers for heat, and UA turbines that generate electricity for the operation of one of three chillers plants for cooling.

Southwest Gas maintains a 24-hour Emergency Response Team (required by the Arizona Corporation Commission). It estimates that, for most ordinary emergencies, gas outages are repaired within (2) two hours.

Emergencies caused by hostile acts could take from 24 hours to two weeks to remedy, depending on location, severity of the damage, and equipment availability and installation. Southwest Gas believes that with its security plan for regulating stations and its ability to isolate individual buildings/facilities and restrict gas transmission, it can respond and fix emergency repairs that may arise to facilitate full recovery.

**Incidents Exceeding Four (4) Hours**

In the event that natural gas is not expected to be restored within **four (4) hours**, UACERT will be activated to assess the situation and begin contingency planning.

Prioritization for an extended natural gas outage will be:

- **Priority 1**: Human welfare
- **Priority 2**: Research areas
  - Animal
  - Biological
  - Other
- **Priority 3**: Structures
  - Buildings with extraordinary requirements or impacts

**WATER**

The importance of water for human health and consumption is obvious. Additionally, many research projects rely on the use of water. Nevertheless, water is an element that can be transported-in from other areas for use.

Water is the third of the three (3) prime resources that are significant factors in the ability to continue academic operations after an extended major campus emergency.

**Water Source: UA Wells**

The primary source of water for the UA campus is from its own wells. Currently, there are (Removed for Security) active wells, (* on Main Campus and * in the ** area) and
one inactive well. The system is configured in such a manner that the City of Tucson’s system serves as the UA backup for water supply.

When the water pressure in the UA system decreases to the point where sufficient water is not being pumped to satisfy needs, the City of Tucson water system is automatically activated to provide water to supplement the UA system.

Tucson Water wells operate off of electrical power. Should there be a power outage for an extended time water supply to the University of Arizona will be affected by:

1. Decreased water pressure, affecting the ability to deliver water to high-rise buildings
2. Decreasing the availability for sanitation, creating a potential for building closure

**Tucson Water Reservoirs and UA**

The City of Tucson has (removed for Security) reservoirs throughout the area, of which (Removed for Security) are in the vicinity of the UA. It also has *** wells to draw from that are interspersed among various interconnect points which permit the flow of city water to the UA. On campus there are (Removed for Security) such interconnecting points. Additionally, UA waterlines generally parallel those of the city. To facilitate planning and mutual support, UA waterlines have been overlaid onto the department’s operation map.

The Tucson Water Department has an emergency plan to address bioterrorism and major impact on the community. Tucson Water has the redundancy of water sources and water flow control at each well to minimize impact on users if one becomes contaminated. The shifts from the (Removed for Security) interconnect points between the UA water and city water exists on campus to permit water flow from city owned pipes to UA water pipes.

**Contamination**

In the event the UA water system becomes contaminated, UA Facilities Management and Tucson Water will work to mitigate impact on the University.

**Suspected Terrorism or Criminal Activity**

In the event there is a suspected criminal/terrorist act with the water system, such as the intentional introduction of a contaminate, or tampering with the wells or water sources on campus Facilities Management shall immedialtley contact UAPD and Risk Management and Safety.
Water Source Interruption

If there is an interruption to the UA water source Facilities Management will:

Assess the situation

Coordinate with Tucson Water

Activate FM Resources

Contact UACERT Chair if the situation adversely affects the campus

Notification of UACERT

The UACERT Chair will be notified and may activate the UACERT when:

1. The UA wells and Tucson Water wells fail to provide adequate supply to the university.
2. Should the contamination create a major disruption to or pose a health hazard to the university the UACERT Chair will be notified and will activate the team.

UA Emergency Contact Information

The UA contacts for the UA water system are ***, Plumbing Shop Supervisor (***), and ***, Staff Technician, Sr. Facilities Management (***********).

The Emergency Contact number for Tucson Water is: Removed for Security
UA GENERATORS

The UA has emergency generators located in the buildings outlined below. In an extended power outage the buildings will be prioritized for power generation.

Priority 1 - Red    Priority 2 - Orange    Residence Halls – Yellow

(Removed for Security Reasons)

<table>
<thead>
<tr>
<th>Bldg Name</th>
<th>Bldg Number</th>
<th>Natural Gas</th>
<th>Diesel(Gal) &amp; use/hr</th>
<th>Volt</th>
</tr>
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RESTORATION TIMELINES:

All timelines have been removed for security reasons