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Sandia National Laboratories

U.S. DEPARTMENT OF ENERGY

Hypothetical Facility Attack Plan

The Lone Pine Nuclear Power Plant

I. SITUATION:

A. Target:

- **Geographical Setting:**

Site geographical characteristics are frequently ignored when planning and preparing an attack, yet these details have a great impact on realistic adversary tactics and equipment selection. They profoundly affect the creation of plausible pre-event scenarios, and are important in the planning and execution phases of an attack.

The characteristics detailed in this section frequently become modifying factors to both adversary actions and PSS system-element effectiveness (detection, assessment, delay, communications, and response) and can also contribute to adversary deterrence.

Frequently, the geographical data provided by the site is incomplete and additional data must be collected. This is the easiest of the data collection to complete in a secure manner, with virtually all information available open-source over the internet or through published works.

1) Site is located in a semi-arid, high desert climate.
2) The site is located about 30km East of the city of Hashbakar.
3) There are a limited number of small communities within 100km radius of the site.
4) The city is less than 100km away from the borders of two neighboring countries.
5) Terrain is flat with little or no deviation in elevation around target area.
6) Vegetation consists mainly of prairie grasses, sagebrush and shrubbery, and is approximately two-feet high.
7) Dead vegetation and debris are commonly blown about by the wind in the spring.
8) Low-flying aircraft and heavy nearby passenger vehicle traffic are common.
9) Occasional earthquakes in the region.
10) Small varmint and predatory animals and various bird species inhabit the area.

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- **Weather and Light Data:**

This section details the site weather conditions at the time of the attack. This information factors heavily into adversary attack planning, as specific tactics can be utilized as a compliment to specific local weather conditions. Response force posture can be inferred from extremes in the weather, and confirmed through surveillance or insider information.

The data in this section frequently become modifying factors to both adversary actions and most PSS system-element effectiveness (detection, assessment, communications, and response).

This data is site-dependent and varies considerably during the year. It is relatively easy to collect and may be obtained in a secure manner, with virtually all information available open-source over the internet or through commonly-published reference sources.

1) *Sunset*: 1813 Hours
2) *Sun Rise*: 0628 Hours
3) *Moon Rise*: 1918 Hours
4) *Moon Set*: 0846 Hours
5) *Moon Phase*: 0%--Illumination
6) *Winds:*
   - Average: 2-5 Km/h
   - Gusting: 50 Km/h
   - From North-North East to South-South West
7) *Temperature*: Day: 18° Celsius. Night: 3° Celsius.
8) *Visibility*: 16 Km, daytime
9) *Cloud*-Cover: Minimal to partly-cloudy

- **Target Areas**

The potential target area at the site are listed in this section. If different security levels are in place at each area, those levels are also listed. This illustrates the areas considered by the adversary team during Target Selection (below).

1. Lone Pine Nuclear Power Plant, AFW-PUMP-RM-TD (Auxiliary Feedwater Turbine Driven Pump Room), INTAKE (Intake Structure)
2.

- **Target Selection**

When choosing a target, an adversary will select the one that meets material type and quantity requirements while taking the least amount of time, the least amount of resources, and yielding the highest probability of success.

Material type and quantity requirements will generally be provided by site Vulnerability Analysis personnel, and this is generally the easiest way to plan an exercise. If left to the adversary to decide between multiple potential targets, the following are considered:

1. mission objectives
2. mission type (theft, sabotage, etc.)
3. the standard attack planning considerations (least amount of time and resources, highest probability of success)
4. material type and enrichment (target attractiveness)
5. target protection (delay and detection associated with specific target storage locations)
6. relative target configurations (does anything have to be done to the targets before use/theft)
7. target availability (how many target objects are available in the immediate area)
8. target portability
9. target-specific characteristics (metals heated to very high temperatures, neutron-emiting sources, immediately-dangerous to life and health conditions, etc.)

Primary Target, Sabotage Operation (Mission would be a success upon the successful disablement of the Turbine Driven Pump Auxiliary Feedwater Train (AFW))

1) Target:
    a. Area: Auxiliary Turbine Driven Pump Room

B. Site Security Systems:

- **Protection Goal**: Prevent adversary attack success
- **Protection Objectives:**

Even without having specific insider information regarding protective force response plans, understanding the force's Protection Objectives can give valuable insight about force response priorities and what will be done during different stages of an adversary attack. This information is much easier and less risky to obtain than detailed force response plans.

1) Detect adversary before attack initiation
2) Deny adversary most suitable attack positions
3) Delay adversary movement into target area
4) Prevent adversary access to general target area
5) Prevent adversary access to immediate target areas
6) Deny adversary task completion
7) Prevent adversary from escaping with target (if appropriate)

- **Protective Force Armament and Equipment:**

It is critically important for an adversary to know what force capability is possessed by the protective force and other responding personnel. Combined with likely patrol locations, the attack can thus be planned to maximize relative adversary firepower and avoid or overwhelm any resistance posed by protective forces.

During tabletop execution, the equipment list serves as a reference for equipment carried by or readily available to responding patrols.

Detailed information about individual equipment for all protective force elements is obtained relatively easily, through direct interaction, surveillance, or an insider. Most equipment details are readily visible or picked up through conversation with response force personnel. Other details (such as ammunition type, precision-rifle equipment, etc.) are not routinely visible but can generally be obtained at low risk through conversation with force personnel.

Equipment: Armed Guards	All **armed guards** are equipped with: • A Makarov pistol with a fully loaded magazine, but the pistol does not have a round in the chamber • two spare magazines of ammunition • a straight baton • one set of handcuffs • a small flashlight • a handheld radio
Equipment: Tactical Response Team	The **tactical response** team members are equipped with • a Makarov pistol with a fully loaded magazine but without a round in the chamber and • a Kalishnikov assault rifle. with a fully loaded magazine but without a round in the chamber (locked in the armory) • two spare magazines of ammunition for each weapon. Both weapons are carried with a fully loaded magazine but without a round in the chamber. • a straight baton • handcuffs • flashlight • handheld radio • body armor is readily available in the response force building

- **Protective Force Organization and Locations:**

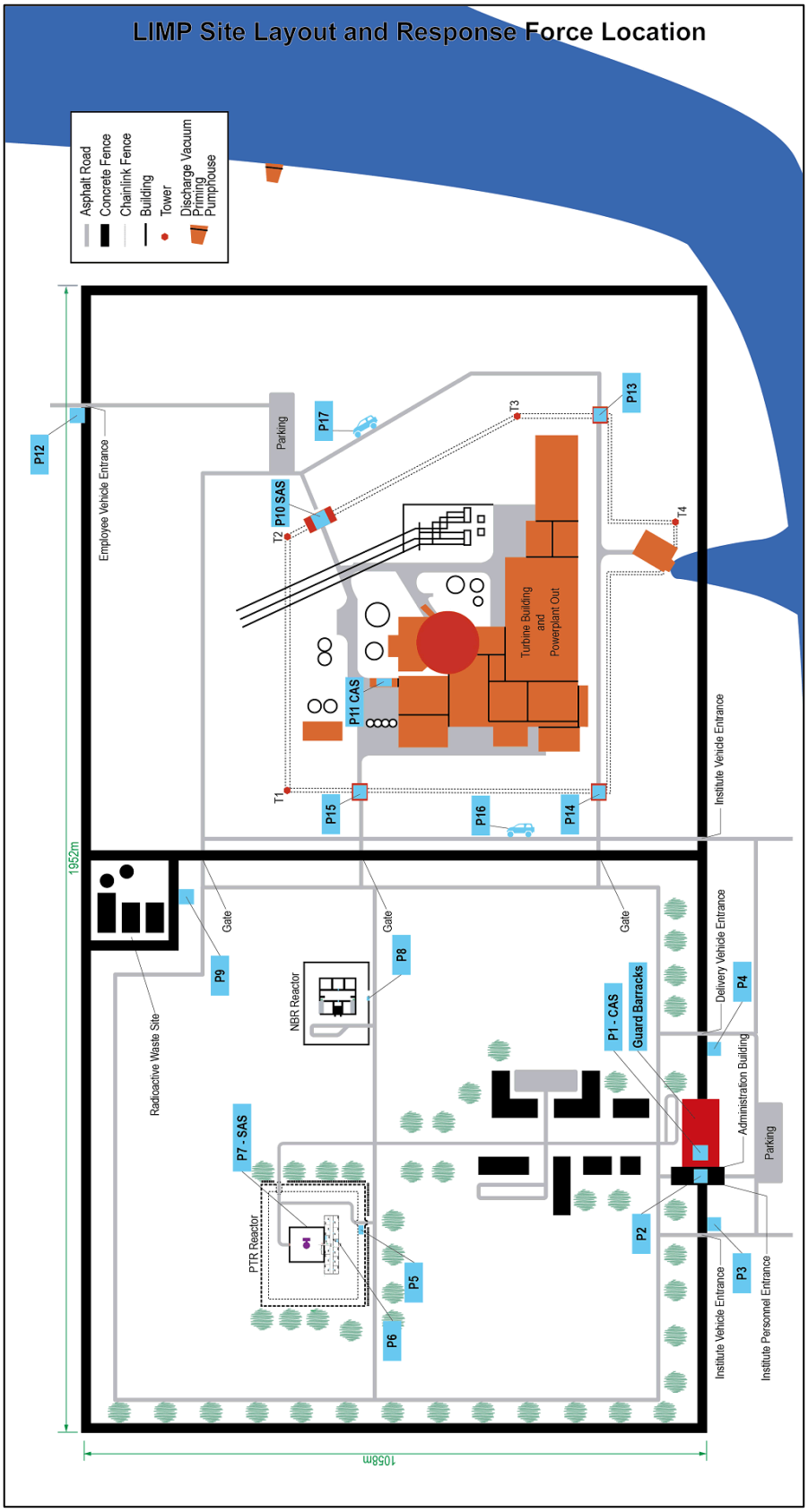
Just as critical in the adversary planning phase is an understanding of how many protective force responders are on duty at any given day or time, what their individual job is (what kind of equipment and skills they have), and where they are located (inasmuch as can be reasonably determined while minimizing risk of detection).

This information is generally provided by Site Vulnerability Assessment personnel; simulating adversary visual and/or radio communications surveillance, or insider knowledge. Provided location information is often incomplete (by one or two patrol locations). All responders must have a determined location before exercise execution begins, and if necessary, patrols can be randomly-placed at the time of attack initiation.

Real-world information collected regarding response force numbers, locations, equipment, and other status are rolled into one document, referred to as a "snapshot" or a "Picture-in-Time" (PIT). Different PITs are gathered for different shifts, times of day, and site operational configurations.

Regarding exercise execution, if a situation arises where a patrol might reasonably see (or otherwise detect) an adversary team member before attack initiation/initial engagement, the outcome should be determined, the effect determined, and exercise execution should begin at that point with subsequent impact to the adversary's planned time-line.

Post No.	**Description**	**Security Personnel** (non-operational hours)	
S-1	Response Force Commander	Captain	1
S-2	Guard Commander	Lieutenant	1
P-1	Response Force Headquarters	Tactical Teams	10
P-1	Central Alarm Station	Guard	1
P-2	Institute Personnel Entrance	Guard	1
P-3	Institute Vehicle Gate	Guard	1
P-5	PTR Personnel/ Vehicle Portal	Guard	1
P-7	Secondary Alarm Station	Guard	1
P-8	NBR Personnel Portal	Guard	1
P-9	Waste Storage Facility	Guard	1
P-10	Random two-man patrol of Institute	Guard	2
		Totals	**21**


LIMP Site Layout and Response Force Location
Asphalt Road
Concrete Fence
Chainlink Fence
Building
Tower
Discharge Vacuum Priming Pumphouse
P12
Employee Vehicle Entrance
Parking
P17
T3
P13
T2
P10 SAS
T4
Turbine Building and Powerplant Out
P11 CAS
T1
P15
P16
P14
Institute Vehicle Entrance
1952m
Gate
Gate
Gate
P9
P8
Radioactive Waste Site
NBR Reactor
P1 - CAS
Guard Barracks
Delivery Vehicle Entrance
P4
Administration Building
Parking
P7 - SAS
PTR Reactor
P2
P5
P6
P3
Institute Vehicle Entrance
Institute Personnel Entrance
1058m

C. Red Cell Organization and Primary Responsibility:

Different members of the attacking force are broken down into different supporting elements where each element pursues objectives and execute tasks to contribute to overall mission success. This section illustrates who is assigned to what element, their operational responsibilities and call-signs, and in which adversary vehicle each begins the attack.

***RV-1* Element:**

1) Romeo-One (***R-1***) - Assaulter
2) Romeo -Two (***R-2***) - Element Leader/Assaulter/Breacher

***RV-2* Element:**

3) Romeo -Three (***R-3***) - Assaulter
4) Romeo -Four (***R-4***) - T-Cell Leader/Element Leader/Assaulter/Breacher

***RV-3* Element:**

1) Romeo -Five (***R-5***) – Driver/Element Leader

D. Red Cell Weapons, Ammunition, and Equipment:

This section serves four purposes:

1. provide an accurate accounting of all equipment that will be used in the attack
2. verify that reasonable weights are assigned to each individual and vehicle
3. illustrate the level of rigor and detail required for accurate, realistic attack planning logistics
4. demonstrate redundancy (if any) that was incorporated into the attack plan

Typical low-rigor performance tests or attack simulations may be little more than out-of-context limited-scope performance tests. For example, a breaching time through a fence-line might be determined by starting a simulated adversary at an outer fenceline with no equipment other than the breaching tool. The time starts when he begins cutting and ends when he gets through the inner fence. This is typically defended as the "worst-case" time.

Use of this methodology artificially reduces breaching times, makes the PPS appear less robust than it actually is, and forces the other elements of the PPS to be made bigger/more costly to compensate for the unrealistically low delay time at the fence. By considering all the elements of a well-planned attack, however, the true value of an individual PPS element can be determined.

One must ask how the adversary got to the fence line in the first place, what complete load was he carrying, and what was his posture/condition upon arrival at the fence? Only when framed with the proper context could an accurate delay time be obtained. This is

true for all limited-scope performance tests related to PPS elements. Without proper loads and operator states, the results are inaccurate and almost always make the site's PPS appear less effective than it actually is.

Proper definition of the equipment and weapons carried by individuals or vehicles leads to high rigor and correctly testing individual PPS elements. It also keeps the adversary in check by forcing them to use only the equipment they brought to the attack (or found at the site). They have to carry everything they chose to bring, with associated decreases in speed and mobility and increases in fatigue.

Individuals cannot carry a tremendous amount of weight for very long. Speed also suffers as weight is added, and in combat, speed is important to survival.

Attack plans without the detail listed in the following pages should be viewed with skepticism. Herein is the level of rigor one would expect from a well-funded, committed terrorist organization intent on attacking a hardened site with sensitive targets. If a hasty attack with minimal supporting documentation is presented, it should be carefully vetted for realism and feasibility before it is run in simulation.

Finally, redundancy must be considered and incorporated into planning.. If, for example, the mission requires a breaching charge for mission success and there is but one charge amongst the operators, what happens if the operator carrying the charge is shot on the way to the breaching point? Without redundancy and/or contingency planning, that mission would thereafter have virtually no chance for success. Redundancy planning requires significant thought and time, usually manifesting itself as significant added weight to be carried by the adversary team members.

1) Individual-issue Uniform, Weapons and Equipment:

a. Cell Members *R-1*, *R-2*, *R-3*, and *R-4*

Item:	**Weight:**
1) BDU (Desert)	01.36 Kg
2) Assault Boots (Desert)	01.36 Kg
3) Load Bearing Vest (Desert)	01.36 Kg
4) Hand-held Radio w/ spare battery	00.45 Kg
5) Head Lamp	00.45 Kg
6) Leatherman Knife	00.45 Kg
7) Head-mounted NVGs w/ IR	02.00 Kg
8) Assault back-pack	00.91 Kg
9) Elbow and Knee Pads	00.45 Kg
10) Flightline Nomex/Leather gloves	00.25 Kg
11) Sure Fire 6P Tactical light	00.45 Kg
12) AK47 w/30-round magazine, ball ammo, select-fire	03.86 Kg
13) Red-Dot Sighting System, night-vision compatible	00.91 Kg
14) 30-round magazine (x4)	03.64 Kg
15) Firing Device Shocktube (4x)	00.45 Kg

16) Explosive Priming System (300 feet)_____ 04.77 Kg
17) 0.5kg TNT equivalent plastic explosive, pre-fused _____ 00.50 Kg
18) Mini-portable Welding Torch _____ 03.64 Kg
19) Welding Rods, ½Kg _____ 00.50 Kg

Total: 27.30 Kg

b. Cell Member *R-5*

Item:	**Weight:**
1) Commercial service technician uniform, complete with shoes _____	03.00 Kg
2) Hand-held Radio w/ spare battery _____	00.45 Kg
3) Leatherman Knife _____	00.45 Kg
4) Head-mounted NVGs w/ IR _____	02.00 Kg
5) Sure Fire 6P Tactical light _____	00.45 Kg
6) Suppressed Ruger .22-caliber pistol and spare 15-round magazine ___	00.90 Kg
Total: 07.25 Kg	

2) Vehicles and vehicle-based equipment

Note: Chevy Suburban/crew-cab truck or similar (each must have four doors and an ample rear storage or bed area; Land Rovers, Toyota Land Runners, Jeep Cherokees, any crew-cab pickup, commercial delivery vehicles, etc. would suffice). Four trucks are needed; one for the VB/IED, two for assault, and one spare. Could be well-used, but must be reasonably reliable. Source from the regional market to better blend into the indigenous population.

Vehicle One (RV-1) – Lead Assault Vehicle

Item:	**Weight:**
1) Vehicle _____	????? Kg
2) Fuel _____	127.00 Kg
3) Fabricated Push-Bar front-grille assembly _____	150.00 Kg
4) 55 kg TNT Bulk Breaching Charge w/ dolly_____	70.00 Kg
5) Tie-Down kit for explosive dolly _____	03.00 Kg
6) Hand-held GPS receiver _____	00.45 Kg
7) ***R-1*** and individual Gear _____	111.39 Kg
8) Nylon Tow Strap, low-visibility, 3m _____	07.00 Kg
9) Towing Eyelet (Rear) _____	02.00 Kg
10) Tire Slime (sealant for minor leaks, 1 KG in each tire) _____	04.00 Kg
11) Bottled water, (8 x 12oz ea) _____	07.00 Kg
Total: 481.84 Kg	
(plus vehicle weight)	

Vehicle Two (RV-2) – Second Assault Vehicle

Item:	**Weight:**
1) Vehicle	????? Kg
2) Fuel	127.00 Kg
3) Fabricated Push-Bar front-grille assembly	150.00 Kg
4) 55kg TNT Bulk Breaching Charge w /dolly	70.00 Kg
5) Tie-Down kit for explosive dolly	03.00 Kg
6) Hand-held GPS receiver	00.45 Kg
7) ***R-3*** and individual Gear	111.39 Kg
8) ***R-4*** and individual Gear	111.39 Kg
9) Nylon Tow Strap, low-visibility, 3m	07.00 Kg
10) Towing Eyelet (Rear)	02.00 Kg
11) Tire Slime (sealant for minor leaks, 1 KG in each tire)	04.00 Kg
12) Bottled water, (8 x 12oz ea)	07.00 Kg
	Total: 593.23 Kg
	(plus vehicle weight)

Vehicle Three (RV-3) – Vehicle Bomb/Improvised Explosive Device Vehicle

Item:	**Weight:**
1) Vehicle	????? Kg
2) Fuel	127.00 Kg
3) 900Kg ANFO Improvised Explosive Device	900.00 Kg
4) Triggering mechanism for IED	04.00 Kg
5) Suspension reinforcement for additional load-capability	100.00 Kg
6) Hand-held GPS receiver	00.45 Kg
7) ***R-5*** and individual Gear	91.34 Kg
8) Nylon Tow Strap, low-visibility, 3m	07.00 Kg
9) Towing Hook (Front)	02.00 Kg
10) Tire Slime (sealant for minor leaks, 1 KG in each tire)	04.00 Kg
11) Bottled water, (2 x 12oz ea)	01.75 Kg
	Total:1,237.54 Kg
	(plus vehicle weight)

Vehicle Four (Spare) – Spare Vehicle

Item:	**Weight:**
1) Vehicle	????? Kg
2) Fuel	127.00 Kg
3) Fabricated Push-Bar front-grille assembly	150.00 Kg
4) 55kg TNT Bulk Breaching Charge w/dolly	70.00 Kg
5) Tie-Down kit for explosive dolly	03.00 Kg
6) Hand-held GPS receiver	00.45 Kg
7) ***R-2*** and individual Gear	111.39 Kg
8) Nylon Tow Strap, low-visibility, 3m	07.00 Kg
9) Towing Eyelet (Rear)	02.00 Kg
10) Spare Fuel (3 x 23 Kg Jerry Cans with 19L fuel/can)	69.00 Kg
11) Spare Coolant (3 x 25 Kg Jerry Cans with 19L coolant/can)	75.00 Kg
12) Spare Engine Oil (3.8L Oil)	04.00 Kg
13) Spare Wheel and Tire for ***RV-3***	34.00 Kg
14) Jack and Lug wrench set for ***RV-3***	12.00 Kg
15) Tire Slime (sealant for minor leaks, 1 KG in each tire)	04.00 Kg
16) Truck tire-patch kit	01.00 Kg
17) Tire inflator can	02.00 Kg
18) Bottled water, (8 x 12oz ea)	07.00 Kg
	Total: 678.84 Kg
	(plus vehicle weight)

II. MISSION:

This section is a succinct statement of the mission objectives. It helps keep the adversary focused during planning, and the exercise participants focused during execution. It states where and upon what the attack is to commence. It also states the type and the date and time of the attack.

The date and time are relevant to the weather conditions as called out above, and also determines the PIT used for the response force.

Red Cell Conducts an armed attack at ***the Lone Pine Nuclear Power Plant*** on 1 April, 2015 at *0200 Hours local time,* to create a sabotage event.

III. EXECUTION:

Concept of Operation:

Before moving into the specific details, it is within the attack plan's concept of operations that an overview of adversary element and team activities are provided. This summary provides a general understanding of pre-attack actions and lays a foundation for better understanding of the actual attack timeline, and its associated individual adversary activities. This attack activities introduction also serves to highlight that as a general rule, site protection plans are designed to fight little or none outside of the site boundary/

protection areas (outside the fence-line), which forces them to fight harder closer to the target area (within the fence-line).

IV. COMMAND and CONTROL:

This section establishes the adversary chain of command for the attack, and also determines who is called upon to address changes in the plan or tactical situation during tabletop execution.

The primary communications method is listed, although adversary actions generally minimize use of and dependency upon radio traffic during the attack. It should be noted that timing and synchronization of simultaneously-occurring attack tasks are difficult to achieve, especially as the tasks or equipment become more complex. This could have significant negative effects on the planned adversary timeline versus reality.

A. Command:

Romeo -Four (***R-4***): Primary Red Cell Leader
Romeo -Two (***R-2***): Secondary Red Cell Leader

B. Communications:

Hand-held Radios with spare battery