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PROJECT SAPPHIRE AFTER ACTION REPORT

(U) HISTORY:

1. (U) Project Sapphire was a sensitive and covert mission to repack and transport 600 kg of uranium-235 (U-235) from the Ulba Metallurgical Plant in Ust-Kamenogorsk, Kazakhstan, to the Y-12 Plant at Oak Ridge, Tennessee, for storage under IAEA safeguards. Project Sapphire involved assets from the Department of State (DOS), Department of Energy (DOE), and Department of Defense (DOD). The 31 person team consisted of 25 technicians from Martin Marietta Energy Systems (MMES), a contractor to DOE, one contract communications technician from EG&G (who normally supplied communications support to the Nuclear Emergency Search Team [NEST]), a medical doctor from DOE, and four personnel from the On Site Inspection Agency (OSIA). Two of the DOE technicians were female, the remainder of the team were male. CDR Paul T. Shaffer, CTIC Michael E. Dosier, CTI1 David J. Roberts, and CTI2 James W. Fite Jr. from OSIA supported Project Sapphire from 8 Oct 94 to 21 Nov 94.

2. (U) CDR Shaffer and CTI1 Roberts became involved with the project while assigned to the Arms Control Implementation Unit (ACIU), American Embassy Almaty, Kazakhstan. A DOE site survey team visited the Ulba plant from 3 Aug 94 to 6 Aug 94, with CDR Shaffer and CTI1 Roberts as part of the Embassy escort team. CDR Shaffer accompanied the site survey team at the request of Ambassador Courtney due to his background in Nuclear Engineering and assignment to the Embassy in the realm of arms control; CTI1 Roberts served as interpreter (the site survey team had not arranged for their own interpreter). Following the site survey, CTI1 Roberts was dispatched to Washington, DC as courier of highly classified material obtained from the plant, CDR Shaffer was requested to return with the project team by Ambassador Courtney to act as Embassy liaison, and OSIA was requested to provide three interpreters for the project.

3. (U) The OSIA team departed Dulles for Knoxville, Tennessee, on 6 Oct 94, to attend final briefings on 7 Oct 94 at the Y-12 Plant, Oak Ridge, Tennessee. Three C-5 cargo transports were utilized to ferry material and personnel to Kazakhstan, and departed over the period of 8 and 9 Oct 94, arriving in Ust-Kamenogorsk over the period 9 and 10 Oct 94. Equipment setup was completed 13 Oct 94, and the first material began the repackaging process 14 Oct 94.

4. (S) The material, highly enriched uranium (approximately 90% enriched in U-235), existed in numerous forms:

- uranium metal chunks;
- uranium oxide pellets;
- uranium-beryllium alloy fuel rods and machining residue;
- uranium contaminated graphite blocks; and,
- residues of various production processes bearing uranium.

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*Michael E. Dosier* Date 18 Sep 96

5. (U) Total mass of the material was roughly 2,200 kg, containing roughly 600 kg of U-235, and resided in 1032 containers of various shapes and sizes at the Ulba Plant. The DOE technicians repackaged the material into 448 "6M" shipping containers, comprising 56 Cargo Restraint Transporters (CRT's). Working six days a week, 12 hours per day, the repackaging effort was completed 11 Nov 94. (NOTE: the team brought 456 "6M's" and 57 CRT's; eight "6M's" are assembled to form one CRT.) Following two days of rest and relaxation, the team used two days to salvage and repack equipment, and was ready for departure 16 Nov 94. Following several days of weather delay, material and personnel departed Ust-Kamenogorsk on two C-5 cargo transports over the period 20 and 21 Nov 94, flying straight through to Dover AFB with three air-to-air refuelings. (NOTE: these were the longest C-5 flights in history.) The material was subsequently shipped via Secure Safe Transporter (SST) overland to Oak Ridge, Tennessee.

(U) POSITIVE ASPECTS OF THE PROJECT:

1. (U) The composition, technical competency, and ingenuity of the DOE technical team was perfect for the nature of the project: there were no technical problems that could not be handled by the team; the team was entirely self sufficient.
2. (U) The DOE technical team brought more than adequate equipment to complete the project, and in fact, left a large quantity of material behind (NOTE: only two C-5's were used to extract the team and material). Consumable items (tape, plastic bags, gloves, anti-contamination clothing, respirator filters, etc) were used much faster than anticipated, requiring delivery of two 4'x4'x8' shipping crates in order to complete the project.
3. (U) A DOE supplied medical doctor accompanied the team. Independent medical support was a must. A highly experienced independent duty corpsman/field corpsman or experienced physician's assistant would also have been adequate. Dr. Robert Goans, the team physician, was very helpful, knowledgeable, and competent.
4. (U) Meal's Ready to Eat (MRE's) were used for lunch at the plant. This prevented a long break in the work day and reduced the total time spent in country. The MRE's probably also minimized the complications associated with a change of diet. There were cases of diarrhea and constipation, but no work days were lost due to the above afflictions.
5. (U) Mr. William Nickels, EG&G communications support contractor, was a valuable asset to the team. Mr. Jeff Starr, Office of the Secretary of Defense, was exceptionally helpful.

(U) NEGATIVE ASPECTS OF THE PROJECT:

1. (U) Funding for OSIA support was obtained through DOE the day before the OSIA team departed Dulles. This presented problems for OSIA and the OSIA team members in arranging for the necessary travel advances.
2. (U) Communication with and coordination of OSIA support was poor. Although OSIA had been provided rough dates for the project, communication from the DOE team leader was non-existent. OSIA became aware of the planned departure date one week prior to departure.
3. (U) Communications support for the project required improvement. Specifically:
  - a. (C) 24 hour secure communications were not available to the team other than through the Personnel Support Section (PSS) at the Y-12 Plant, Oak Ridge. Initially, the communications plan called for secure communication nodes at NMCC, PSS, OSIA Operations Center, and Nellis Air Force Base. Actual communication nodes were J4 and PSS. At the start of the project, J4 was manned on a 24 hour basis, but when the Iraqi troop movement crisis was over, the J4 office shifted to normal work hours.
  - b. (C) Initial secure communications with J4 required improvement. For the first week of the project, back shift personnel answering the designated phone were not aware of the project, were less than helpful, and were not able to obtain the special COMSEC keys for the SECTEL 3500. This problem was resolved with Mr. Jeff Starr's help.
  - c. (U) Secure communications with the Embassy in Almaty were not available. Carefully constructed unclassified status reports were passed over clear lines. The Embassy received classified status reports via front channel cables. The lack of secure communications with the Embassy was of particular concern and a potential OPSEC vulnerability.
4. (C) OPSEC was a grave concern. DOE team members were poorly prepared for the mission, failed to grasp the gravity of their situation, and failed to follow guidance. Numerous EEFI were passed during "health and welfare" calls home and classified technical conversations occurred at the hotel, within earshot of foreign nationals. Additionally, some members of the DOE team disregarded OPSEC and basic safety/security guidance by placing phone calls home through the local phone system, and disregarding the established buddy system. These problems were partially corrected, but it took extraordinary effort and diligence.
5. (C) The technical competency of the DOE team was reduced by a lack of clear and forceful leadership. The team was poorly disciplined and the DOE team leader was not forceful (a

case of too many chiefs and not enough indians). The DOE team leader was not sufficiently experienced to lead, manage, or supervise a group of this size or a project of this magnitude. He operated on the level of a typical, inexperienced junior officer (failure to meet commitments, reactive rather than proactive, involved in minutiae vice supervising and overseeing).

6. (C) Some DOE team members were not physically suited for the mission. The lack of adequate urgent medical care, time delays involved in obtaining adequate medical care, and the general deprivations associated with the location of the mission, would seem to make vigorous medical screening a must. One member of the team was a borderline diabetic. Another member of the team suffered from chronic low blood sugar. As a result of this medical condition (low blood sugar), plus the less than judicious application of alcohol, the resulting mess from vomiting, urinating, and defecating in his bed, his room, and his bathroom made for a serious problem. Fortunately, during this one known incident, he did not suffocate. He did however manage to clean himself up enough to be presentable the next morning, but left his room for the maids to clean up.

7. (C) Departure of the team was delayed by bad weather, mechanical problems, and miscommunication. The original J4 tasking message called for five C-5's to support extraction of the team and cargo with:

- Three C-5's arriving Ust-Kamenogorsk from Turkey on 16 Nov;
- A fourth C-5 (ready spare) from Turkey arriving on 17 Nov; and,
- A standby C-5 in Rota, Spain.

Two C-5's were to depart with the U-235 on 18 Nov (three, if weather required reduced loading), with the remaining C-5(s) departing 19 Nov with salvaged gear and remaining personnel. Chronologically:

- Poor weather forecasts (and actual weather) prevented arrival on 16 Nov. At this point, there were only three C-5's on the ground in Turkey. Neither AMC, TACC, nor the J4 duty officer could explain what happened to the other two C-5's, and were unaware that five C-5's had been tasked to support the mission.

- Outdated weather forecasts obtained by the C-5 mission commander prevented C-5 arrivals 17 Nov.

- Mechanical problems and outdated weather forecasts obtained by the C-5 mission commander prevented C-5 arrivals 18 Nov, even though the Defense Attache to Kazakhstan (an Air Force C-130 pilot) was providing updated forecasts and current weather for Ust-Kamenogorsk, Semipalatinsk, and Almaty to TACC.

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- One C-5 arrived 19 Nov, subsequently uploaded and departed 20 Nov with half of the U-235.

- Two C-5's arrived 20 Nov, and departed 21 Nov.

8. (S) One of the Ulba plant personnel was particularly antagonistic. He repeatedly failed to meet commitments, provided contradictory and false information, and escorted two team members (fortunately equipped with respirators and anti-contamination clothing) into a building that contained a process container with a beryllium/uranium metal fire in progress. The DOE team leader's proposed solution to these problems would have lead to further problems. The DOE team leader did follow seasoned guidance and the individual in question was almost completely removed from further interaction with the U.S. team.

(U) RECOMMENDATIONS (for the future):

1. (U) Subject deploying non-military personnel to tighter medical screening; select team members on the basis of technical expertise and physical screening.

2. (U) Assign a mission commander with greater experience. Assign a technical team leader subordinate to the mission commander.

3. (U) Conduct thorough OPSEC briefings, complete with case studies for less experienced personnel.

4. (U) Ensure adequate secure communication nodes exist for redundancy and reliability.