Prefiled Staff Exhibit 47

EXHIBIT B

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

August 27, 2003

Docket No. 03036239 License No. 37-30804-02

James Wood
President
CFC Logistics, Inc.
4000 AM Drive
Quakertown, PA 18951

SUBJECT: INSPECTION 03036239/2003001, CFC LOGISTICS, INC., QUAKERTOWN, PENNSYLVANIA

Dear Mr. Wood:

From February 13, 2003 through August 6, 2003, Sattar Lodhi, of this office conducted inspections of your activities related to the construction of the Genesis I irradiator at your facilities at the above address. On April 2, 2003, Suresh Chaudhary, and on July 22, and August 6, 2003, Harold Gray of Division of Reactor Safety accompanied Dr. Lodhi to review and discuss various engineering specifications and aspects of the planned irradiator. Information provided during various telephone discussions was also considered during the inspection.

The inspection consisted of evaluation of site characteristics, appropriateness of materials used in the construction and fabrication of components, the procedures followed in the fabrication of various components, adequacy of equipment for the intended service, and discussions with your engineering staff involved in fabrication and installation of various components of the irradiator. The inspections were conducted to verify that the completed facility can be operated safely and meets the applicable NRC requirements. The findings of the inspection were discussed with you and/or members of your organization during various stages of the inspection. A report summarizing the findings of the inspection is enclosed.

Within the scope of this inspection, we conclude the facility has been constructed in accordance with your application for a license.

No reply to this letter is required. In accordance with 10 CFR 2.790, a copy of this letter and the enclosed report will be placed in the NRC Public Document Room and will be accessible from the NRC Web site at http://www.nrc.gov/reading-rm.html.

Your cooperation with us is appreciated.

Sincerely,

Original signed by John D. Kinneman

John D. Kinneman, Chief
Nuclear Materials Safety Branch 2
Division of Nuclear Materials Safety

Enclosure:
Inspection Report No. 030-36239/03-001

cc:
Marie Turner, Radiation Safety Officer
Commonwealth of Pennsylvania

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

INSPECTION REPORT

Inspection No.	03036239/2003001
Docket No.	03036239
Licensee:	CFC Logistics, Inc.
Location:	4000 AM Drive Quakertown, PA 18951
Inspection Dates:	February 13, 2003 through August 6, 2003

Inspectors:

Suresh K. Chaudhary — 08/19/03
Suresh K. Chaudhary
Reactor Engineer
Date

E H Gray — 8/20/03
Harold Gray
Senior Reactor Engineer
Date

Sattar Lodhi — 8/27/03
Sattar Lodhi, Ph.D.
Health Physicist
Date

Approved By:

John D. Kinneman — 8/27/2003
John D. Kinneman, Chief
Nuclear Materials Safety Branch 2
Division of Nuclear Materials Safety
date

Document Name: G:\Docs\Current\Insp Report\R37-30804-02.2003001.wpd
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EXECUTIVE SUMMARY

CFC Logistics, Inc.
NRC Inspection Report No. 03036239/2003001

CFC Logistics, Inc. has applied for an NRC materials license to possess and use sealed sources containing cobalt 60 in a pool irradiator at their Quakertown, Pennsylvania facility. The irradiator will be located at CFC's Quakertown refrigerated storage warehouse for storage of perishable food products. The application requests authorization to use sealed sources containing up to 1,000,000 curies of cobalt 60 in the irradiator. The irradiator will be used to irradiate food items, cosmetics, and pharmaceutical products.

The proposed irradiator is described in CFC's application dated February 19, 2003 (ML030630036). Inspection was conducted from February 13, 2003, to August 6, 2003, to review the fabrication, installation and testing of various components of the irradiator. Staff of the Division of Reactor Safety evaluated site preparation and the material and procedures used in the fabrication of the pool and other structures and found them to be in accordance with standard engineering practices. In addition, the seismic environment of the site and the effect of a seismic event on the facility were considered. The inspectors observed movement and operation of the irradiator components and the system functioned as expected. The inspectors also reviewed the hoists and load bearing components of the system.

The system is designed to meet applicable NRC requirements and has been built in accordance with specifications in the application. The completed concrete and steel structure conforms to the designs and drawings; construction procedures and process controls were adequately implemented to assure conformance to the design specified in the application. The irradiator installation appears to be well designed and well built. The system performed properly during pre-operational demonstrations and procedures appear to be adequate to assure safe operation.

While heavy load drops or seismic events are unlikely, engineering analyses indicate that such events will not result in a loss of source shielding or damage to the radioactive sources that would release cobalt 60 into the pool.

REPORT DETAILS

I. Organization and Scope of the Program

a. Inspection Scope

The scope of the inspection was to review the applicant's activities related to construction of a pool irradiator and plans for use of the irradiator upon completion.

b. Observations and Findings

CFC Logistics, Inc., (CFC) originally submitted an application dated January 30, 2003, for a license to construct and operate a pool irradiator at its facility in Quakertown, Pennsylvania. In the application, CFC stated that construction activities were underway. On February 6, 2003, during a telephone conversation with the proposed Radiation Safety Officer (RSO), and in a letter dated February 12, 2003 (ML030440043), Region I reiterated the provisions in 10 CFR 36.15 to CFC that any activities undertaken prior to issuance of a license are entirely at the risk of the applicant and have no bearing on the issuance of a license.

On February 13, 2003, an inspector visited the CFC facility in Quakertown, Pennsylvania, to discuss administrative deficiencies in its application dated January 30, 2003. During the visit the inspector noted that CFC had started preliminary construction work at the site.

Following the February 13 visit, the applicant withdrew the original application and submitted a revised application dated February 19, 2003 (ML030630036) that addressed the administrative deficiencies in its original application. The facility and CFC's activities have been reviewed against the February 19, 2003 application.

NRC inspectors visited the proposed facility on nine occasions to review construction activities and to evaluate various aspects of the design. Three of these visits included staff from the Division of Reactor Safety. Members of NRC Regional management were present during four visits.

II. Management Oversight of the Program

a. Inspection Scope

The scope of the inspection was to verify effective oversight of the program by the applicant's management.

b. Observations and Findings

CFC Logistics, Inc., is a part of Clemens Family Corporation, and James Wood is the President of CFC Logistics, Inc. Activities within CFC are divided into three operations, namely, Warehouse Operations, Administrative Operations, and Irradiator Operations, and each operation has a manager. Thomas Clemens is the Project Manager for the irradiator project and is responsible for all aspects of construction of the irradiator facility. Marie Turner is manager of Irradiator Operations, and is also proposed to be the Radiation Safety Officer (RSO) named on the license. Other members of the Irradiator Operations staff are irradiator operators and material handlers. The RSO reports to the President of CFC and irradiator operators report to the RSO. There will be a Radiation Safety Committee (RSC) to provide supervision to the radiation safety program. Membership of the RSC will include the RSO, an additional management representative and an irradiator operator.

c. Conclusions

The applicant's management structure and the proposed oversight of its activities meet NRC requirements and guidance provided in Section 3 of NUREG 1556, Volume 6.

III. Facilities and Equipment

a. Inspection Scope

The scope of the inspection was to verify that the facilities and equipment are constructed in accordance with the specifications described in the application and meet appropriate NRC requirements and that the applicant has appropriate operating and emergency procedures.

b. Observations and Findings

General Description

The facility is located in Quakertown, Pennsylvania. The facilities are described in the application dated February 19, 2003 (ML030630036), and letters dated April 22, 2003 (ML031210348), June 30, 2003 (ML031960588), July 8, 2003 (ML031900700), and

July 22, 2003 (ML032030333). These documents were reviewed by the NRC staff as part of the licensing process.

The irradiator (trade name GENESIS I) was designed by Gray*Star, Inc. Detailed engineering design and fabrication of all major components, including the electronic controls, were accomplished by Clayton H. Landis Company (CHL) at its Engineering Facility in Souderton, Pennsylvania. CHL contracted with an electrical engineer to develop the electronics and programmable logic controls associated with the irradiator and its operations, including the automated movements of product carriers (bells) into and out of the pool. In addition, CFC hired a third party engineer to witness and record key activities during construction and assembly of the irradiator.

The irradiator is located in an enclosed area within a large hall, one of several that comprise a cold storage facility, at the Quakertown site. The irradiator consists of a shielding pool which is largely below floor level. The radioactive sources will be placed in a source container (or plenum) at the bottom of the pool and will remain there during routine operation. A trolley and hoist system will lift product carriers, place them into the pool for irradiation and then remove them. The water quality in the pool is maintained by a circulating water purification system which draws water from the pool, runs it through a resin filtration system, and returns the water to the pool. The water circulation system is equipped to continuously monitor the conductivity of the pool water to assure compliance with 10 CFR 36.63. A radiation detector near the resin filter is designed to detect increases of radioactivity in the water.

The pool is a double-walled rectangular box prefabricated at CHL Engineering facilities. The application includes a diagram of the pool on page 47, and a copy of the diagram is shown in Figure 1 (also at ML03161087) of this report. The inner walls are made of ¼ inch thick stainless steel and the outer walls are made of ¼ inch thick carbon steel. The inner and outer walls are 6 inches apart and on each side of the pool structure the walls are joined by two 6-inch steel "I" beams welded lengthwise between them. The 6-inch wide space between the inner and outer walls was filled with concrete after the pool was placed on the concrete foundation. Within the emplacement at the site, the outer walls of the pool are surrounded by cement grout. The open edge of the pool is 42 inches above the floor which provides a barrier to prevent personnel from inadvertently falling into the pool. The main pool is connected to a smaller pool to hold water displaced by the product bells when they are lowered into the main pool.

The pool does not have any penetrations below the safe water limit level. Losses of water from evaporation and normal use will be made up by manually operating a valve. All connections to the pool are designed to prevent any loss of pool water due to siphoning. (10 CFR 36.33)

The source container or plenum is fixed at the bottom of the pool by a retaining mechanism. It is locked in place at the top of the pool by a locking bar and only authorized individuals have access to the key to unlock the retaining mechanism. The locking bar spans the width of the pool and divides the pool in half. The plenum containing sealed sources remains fixed at the bottom of the pool during normal operations. Should it be necessary to raise the plenum, the sources will be removed from the plenum before it is raised. The plenum is lowered or raised mechanically only after unlocking the retaining mechanism and breaking a safety seal.

A diagram of the plenum is provided on page 49 of the application and Figure 2 (also at ML031610287) of this report. The plenum consists of 16-3 inch diameter vertical stainless steel tubes arranged in a vertical plane. Holders or racks containing the sources are inserted into these tubes. After loading, each tube is closed and sealed with a plug, and water is pushed from the tubes using compressed air, so that the sources are not in contact with pool water during operation. Then a pump continuously circulates air through the plenum tubes and a high efficiency particulate air (HEPA) filter. A radiation detector continuously monitors the air filter for radioactivity thereby providing a means to check for a leaking source. Another radiation detector monitors the radiation dose rate at the surface of the pool. The tubes that carry the air from the surface to the plenum and back to the surface are configured in such a way that there is no direct path for radiation from the sources to the surface. CFC plans to give particular attention to these tubes during the radiation survey after the sources are loaded.

Each of the three radiation monitors (air filter, resin filter and pool surface) have audio and visual alarms should the radiation level exceed the preset limit.

Procedures for operating the various systems, including the associated radiation safety and emergency procedures were reviewed.

Review of Construction Activities

An inspector observed the excavation for the pool on February 13, 2003. The field inspection report prepared by the applicant's independent engineering/geology company during excavation for the pool stated that the ground in the excavation was rocky and characterized the first 8 feet of excavation below floor surface as red/brown clayey gravel, followed by another 8 feet of layered red fractured shale in transition to penetrating 4 to 5 feet into the bedrock (red shale) at the bottom of excavation. The report also states that the bedrock is solid with no signs of fissure, and approved a bearing capacity of 2000 lbs/sq.ft.

Inspectors visited the both the irradiator facility and the fabrication shop at various times to verify the adequacy and acceptability of the construction material, techniques of construction, and conformance of the completed structure to design specification and drawings to those specified in the license application. An inspector reviewed the documentation for the foundation bearing capacity test, structural concrete inspection report, concrete mix design, and seven (7) and twenty-eight (28) day compressive strength tests for structural concrete and cement grout, and backfill concrete reports. The in-place pool, concrete floor around the pool, the pool upper structure, and the steel frame for the mechanical hoist and monorail were also reviewed during assembly and when completed.

Inspectors also visited the nearby fabrication facility and observed various components being fabricated/assembled, including the completed double-walled pool, before it was placed in the excavation. An inspector reviewed the welding procedures and specifications, the nondestructive evaluation (NDE) of finished welds of the pool, and the qualifications of the welders, to verify conformance of the fabricated pool to the design specified in the application. The applicant's records indicated that the pool structure was successfully tested for leakage on July 11, 2002 (10 CFR 36.41(c)).

On July 22, 2003, and August 6, 2003, the inspectors visited the facility in Quakertown to review the performance of the completed mechanical components of the irradiator without radioactive sources installed. The inspectors observed complete cycles of the movements of the bells into and out of the pool and around the overhead monorail. An inspector observed a demonstration of response of the bell carriers in case of power failures on July 24, 2003, and noted that the bells came to a standstill when the electrical power to the system was turned off.

The inspectors reviewed operation of the water purification system on August 6, 2003, and noted that the conductivity of pool water was approximately 9.5 microsiemens/cm. 10 CFR 36.63 requires that the conductivity of the pool water remain less than 20 microsiemens/cm under normal circumstances.

c. Conclusions

Design, fabrication and assembly of irradiator components at CHL facilities, and construction at the site in Quakertown has been adequately supervised by the respective project managers.

Observations and comparisons of components to the engineering drawings and their description in the application confirmed the applicant's conclusions that the facility has been constructed in accordance with the specifications and drawings included in the application as supplemented by the additional submissions and in accordance with good engineering and construction practices. The completed concrete and steel structures conform to the design and drawings specified in the application; construction procedures and process controls were adequately implemented to assure conformance to the specified design.

Dry runs of the equipment observed during inspections demonstrated that the equipment functioned as designeded.

IV. Radiation Safety Procedures

a. Inspection Scope

The scope of the inspection was to review the applicant's radiation safety procedures.

b. Observations and Findings

The inspectors discussed CFC's plans for conducting surveys during and following the loading of the sources and for evaluating the exposures of staff. The applicant plans to have a licensed organization supervise the source loading and provide training for their staff in the procedures for source handling and loading. The procedures for operating the pool water circulation system, the associated radiation monitor and the radiation monitors on the air system and near the pool were reviewed.

c. Conclusions

The applicant has adequate plans and procedures for conducting surveys during the loading of the sources and operation. The applicant's planned radiation survey instrumentation is adequate. Procedures for operating the pool water system and the radiation monitors are adequate.

V. Emergency Procedures

a. Inspection Scope

The scope of the inspection was to review the applicant's emergency procedures.

b. Observations and Findings

The applicant's emergency procedures and plans for implementation were reviewed and discussed with CFC staff. The applicant's procedures address the applicable issues required by 10 CFR 36.53, including loss of electrical power, abnormal radiation levels and suspected personnel overexposure. The inspectors determined that the RSO is knowledgeable of the trigger levels for emergency procedures and actions that need to take place. The inspectors also reviewed CFC's actions to familiarize and train police and emergency responders. CFC indicated that they have held at least three sessions with police, local fire fighters, emergency management personnel, other local government staff and emergency medical responders (ambulance). Sessions included review of the characteristics of radiation, tour of the facility, discussion of responsibilities of CFC staff (RSO and operators) and other appropriate topics. Training for fire fighters, ambulance and emergency responders was greater than two hours in length. Training for police was somewhat shorter. An inspector contacted management representatives for the police and fire fighters and confirmed the training occurred as stated.

c. Conclusions

The applicant has adequate emergency procedures and plans for implementation. The applicant intends to assure that local emergency workers and first responders have appropriate information concerning the facility.

VI. Security Systems and Procedures

a. Inspection Scope

The scope of the inspection was to review the features of the facility associated with security and the applicant's procedures for assuring appropriate implementation of those features.

b. Observations and Findings

CFC included in the design specific features to provide for effective access control. Access to the irradiator enclosure is restricted and the facility is equipped with intrusion alarms. Inspectors reviewed the applicant's proposed security systems and access control procedures. The inspectors determined that representatives of the Pennsylvania State Police have visited the facility and discussed their capabilities for response, if needed.

c. Conclusions

The facility includes appropriate design features for a security program. The applicant's procedures are adequate to assure that only authorized individuals are allowed access to the irradiator and to detect attempted unauthorized access.

VII. Engineering and Design Evaluation

a. Inspection Scope

The inspectors evaluated the design, engineering practices, and material used in the fabrication of various components, and integrity and capacity of the assembled components to perform their respective tasks. This included a review of adequacy of the pool integrity, overhead crane-hoist supporting track and the hoist as-designed and as-built capability to handle working loads, plans for in-service maintenance and testing, and an evaluation of the response of the facility to load drops either from equipment failure or a seismic event although the probability and the expected magnitude of a seismic event are low.

b. Observations and Findings

The inspectors reviewed the design parameters and adequacy of various equipment for service and held discussions with CHL engineers regarding the design.

Hoist Design and Heavy Load Handling

The inspectors discussed and reviewed: the design load limit for various components including the attachment lifting lugs; the cable and cable connector strength and test results; cable strength specification versus the load requirements, the hoist motor horsepower versus the load limitation for motor stalling before exceeding the load limit, safety considerations and control system response in case of a power failure during load lifting/moving sequence; and hoist and supporting structure susceptibility to a credible seismic event (earthquake). The inspectors discussed with CHL engineers the design of the overhead crane-hoist supporting track and the hoist as-designed and as-built capability to handle the working loads of placing loaded containers into and out of the pool. The inspectors also reviewed calculations related to the strength of various components of the system and their ability to withstand static and dynamic stresses during normal operation and those caused by a failure of the support cables.

The inspectors noted that the hoist cable test assembly, with lifting fittings part numbers 651 and 653, the two types used for lifting the bell assembly, was tested to failure and demonstrated a tensile strength of 24,410 pounds (lbs). This was over 3.2 times the maximum weight of the loaded bell, which is approximately 7,500 lbs. Because there are two lifting cables per bell, the hoist cables provide an overall safety factor on lifting of 6.5.

Load Drop

While a load drop is unlikely, the significance of such a drop was evaluated by the inspectors. The inspectors reviewed the features which assure pool integrity and the possible damage to the pool structure or the plenum and sources in the event that a loaded bell falls on the structure. This included discussions with CHL engineers and a review of drawings and calculations performed by CHL. Based on their review and discussions with the CHL engineers, the inspectors concluded that, due to the geometry of the product containers (or bells) and the pool, including the locking bar, the following scenarios involving a dropped bell needed to be examined further:

(1) a dropped bell which strikes the edge of the pool directly or at an angle (as a result of a single cable failure);

(2) a dropped bell directly over the pool which enters the pool perfectly upright within the constraints of the stainless steel guide rails;

(3) a dropped bell that strikes the locking bar;

(4) a dropped bell that falls away from the pool.

The inspectors' assessment of the impacts of a falling bell under these scenarios is as follows:

Scenario (1): The structural strength of the pool edges and its capability to resist impact is quite high since the upper pool edge is capped with ¼ inch thick stainless steel over a structure of ¼ inch thick stainless steel inner wall, 6 inches of 4,000 pounds per square inch (psi) strength concrete reinforced by twin steel I-beams on each side of the pool, and an outer carbon steel wall. Because of this robust structure, dropping a bell even from the maximum height of the hoist onto the pool edge is expected to result in only minor surface denting and/or scratching. The inspectors concluded that, under this scenario, damage to the pool liner resulting in loss of shielding and damage to the sources was not credible.

Scenario (2): The inspectors determined that, in the event of a potential crane failure or load drop directly over the pool, the bell would either fall straight into the pool following the guide rack or strike at an angle and not fully enter the pool. Because the clearances between the bell and the sides of the pool are very small - approximately ½ inch - the bell is much more likely to become stuck than to enter the pool unimpeded. However, if the bell were to enter the pool in free fall, its velocity would be impeded by the hydraulic dampening of the pool water flow reduction. The bell is not likely to have an adverse effect on the plenum because of this reduction in velocity, the stainless steel guide rails that are designed to prevent the bell hitting any part of the plenum or the pool liner, and the inherent strength of the plenum. In the event that the bell strikes the edge of the pool at an angle, only minor surface dents or surfaces is expected as noted in Scenario 1 above . In either case - a falling bell that becomes stuck in the pool opening or one that enters the pool itself - damage to the pool liner resulting in loss of shielding or to the sources in the plenum are not considered credible.

Scenario (3): Under the scenario, a dropped bell would impact on the locking bar that sits on top of the pool. The bar is made of 1/4 inch thick stainless steel plate formed to a 5 inch wide channel shape with 3.5 inch high edges spanning a pool inner width of 68 inches. Downward deformation of the lock bar approximately ½ inch would result in contact with other structural members in the pool effectively reducing the span distance to 58 inches. The lock bar is bolted to the pool edges at both ends by ⅝ inch diameter F593C-TME bolts and is boxed in at both ends by bolted stainless steel components that also provides support to bell guides. The span of the lock bar between the boxed in areas is 50.5 inches. This results in the lock bar being fixed and strengthened at both ends such that it is much stronger than a simple 5x3.5 inch channel.

Only considering the vertical sides (2x3.5 inch) and 1 inch of the horizontal section of the lock bar, there is (8" length x 1/4" thickness) 2 square inches of loadable cross-section of stainless steel in the lock bar. Stainless steel has a strength of 75,000 psi minimum. Using a safety factor of 4, two square inches would support a load of 37,000 lbs in tension or 18,750 lbs in shear. This compares favorably to the total weight of a load bell and its maximum load which is approximately 7,500 lbs or a loading of approximately 3750 lbs with one cable remaining functional.

CHL drawing No. 33248-205-242-001, Rev 1, shown in Figure 3, presents a calculation of the strength of the lock bar showing vertical strengths of the lock bar to be 5231 lbs at its center line and 11664 lbs at 8.75 inches inside the inner pool edge. The vertical strength of the lock bar at its center line (5231 lbs) is less than the maximum weight (7,500 lbs) of a loaded bell. However, this is not of safety concern because if only one cable fails, the bell will swing and one of its lower edges will strike the lock bar at a point away from the center line. On the other hand, if both cables fail, the weight of the bell will be at the ends of the lock bar because the bell is open at the bottom. Furthermore, the lock bar also has extra support at each end that effectively reduces the "free" length of the bar to approximately 58 inches, which is less than the length of the bell (approximately 66 inches). Therefore the weight of a fallen bell will be on the sections of the lock bar that have additional support. Accordingly, the inspectors concluded that, under this scenario, damage to the pool liner resulting in loss of shielding or damage to the sources was not credible.

Scenario (4): The inspectors concluded that if the bell were to fall away from the pool, striking the concrete floor or any ancillary equipment, the result would not be a loss of shielding or damage to the sources.

Seismic Event

10 CFR 36 applies certain design considerations for shielding walls at panoramic irradiators located in seismic areas. Although these considerations do not apply to underwater irradiators such as the one constructed by CFC, the staff evaluated seismic hazards for the CFC facility.

The staff consulted the U.S. Geological Survey (USGS) National Earthquake Information Center web site as well as the Limerick Generating Station Final Safety Analysis Report. Those sources indicated that the Quakertown area is physically located between the Piedmont Lowland section of the Piedmont physiographic province and the Reading Prong section of the New England physiographic province. A review of historic seismic events within 200 miles of the Quakertown area indicates that the highest intensity event recorded was a level VII on the Modified Mercalli Intensity Scale (MMIS). The USGS describes the effect of such an event as "Damage negligible in buildings of good design; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken." USGS data indicate that over a 50 year period in the Quakertown area, there is a 2% occurrence probability of a seismic event with peak ground acceleration (PGA) of 0.16g (0.16 times the acceleration of gravity). Given that the projected operational life of the irradiator is less than 50 years, the likelihood of an event of this magnitude is considered low.

The staff's observations during visits to the facility, review of the design drawings, and conversations with the design engineers led to the conclusion that the final pool structure is a robust one. Accordingly, a seismic event that reaches the intensity described above is likely to result in negligible or no damage to the pool. Damage could occur to the support structure for the product delivery system as a result of ground acceleration, but the pool and the sources within the pool are expected to be unaffected. Based on review of the design and observation of the placement of the pool, seismic activity of the intensity typical of the region is not expected to adversely affect the sources in the pool.

If a seismic event were to occur while the bell was in the pool, the bell's lateral motion would be limited by the ½ inch clearance to the guide rails. The motion is not expected to have a significant effect on the pool structure. A seismic event while the bell is outside of the pool guide rails would result in the bell being fixed in space by inertia while the earth, building and crane move in the seismic wave. This would stress the hoist cables in the same way as an impact load; however, with a demonstrated safety factor of three on each of the two redundant cables, failure of either is not credible at the expected maximum seismic loading. This extra lifting safety factor discussed above is useful in evaluating the significance of a seismic event even in the more severe condition of having one lift cable severed. As noted above, the peak ground acceleration in the Quakertown area is projected to be 0.16g. This represents a maximum loading that is a small fraction of the loaded bell weight. In comparison to a seismic event magnitude of 0.16 g, the stress on the one remaining cable after severing of the other represents a bounding or maximum loading condition. In this case, the bell would be supported by the remaining cable with a safety factor of over 3, which is an acceptable condition. If a seismic event occurred while the bell was above the pool and caused a hoist or the load support failure, the dropping bell would have the same effect as discussed in the scenarios above.

c. <u>Conclusions</u>

The irradiator installation appears to be adequately designed and constructed. The system performed properly during operational demonstrations and procedures appear to be adequate to assure safe operation.

The motor hoist, cables and associated frame are adequate for carrying the intended loads. The system is designed against a motor driven component failure by having the motor stall horsepower below the torque level required to fail any component in the lifting train. Based on review of all the available information, a load drop is considered an unlikely event. In the event of a load drop under the four scenarios described above, the damage to the pool liner or irradiator assemblies are not credible results and damage to the pool's upper structure will be limited to minor dents or scratches on the top surfaces.

A crane failure or load drop anywhere in the building except directly over the pool would neither damage the sources nor lead to a loss of shielding.

These evaluations of the damage to the pool structure in case of a loaded bell falling on the structure, are in agreement with the applicant's evaluation described in its letter dated July 22, 2003 (ML032030333), in response to NRC's letter dated July 18, 2003 (ML032020137).

The pool structure and the plenum are also not expected to suffer any significant damage due to a seismic event of Level VII intensity on the modified Mercalli scale.

VIII. Exit Meeting

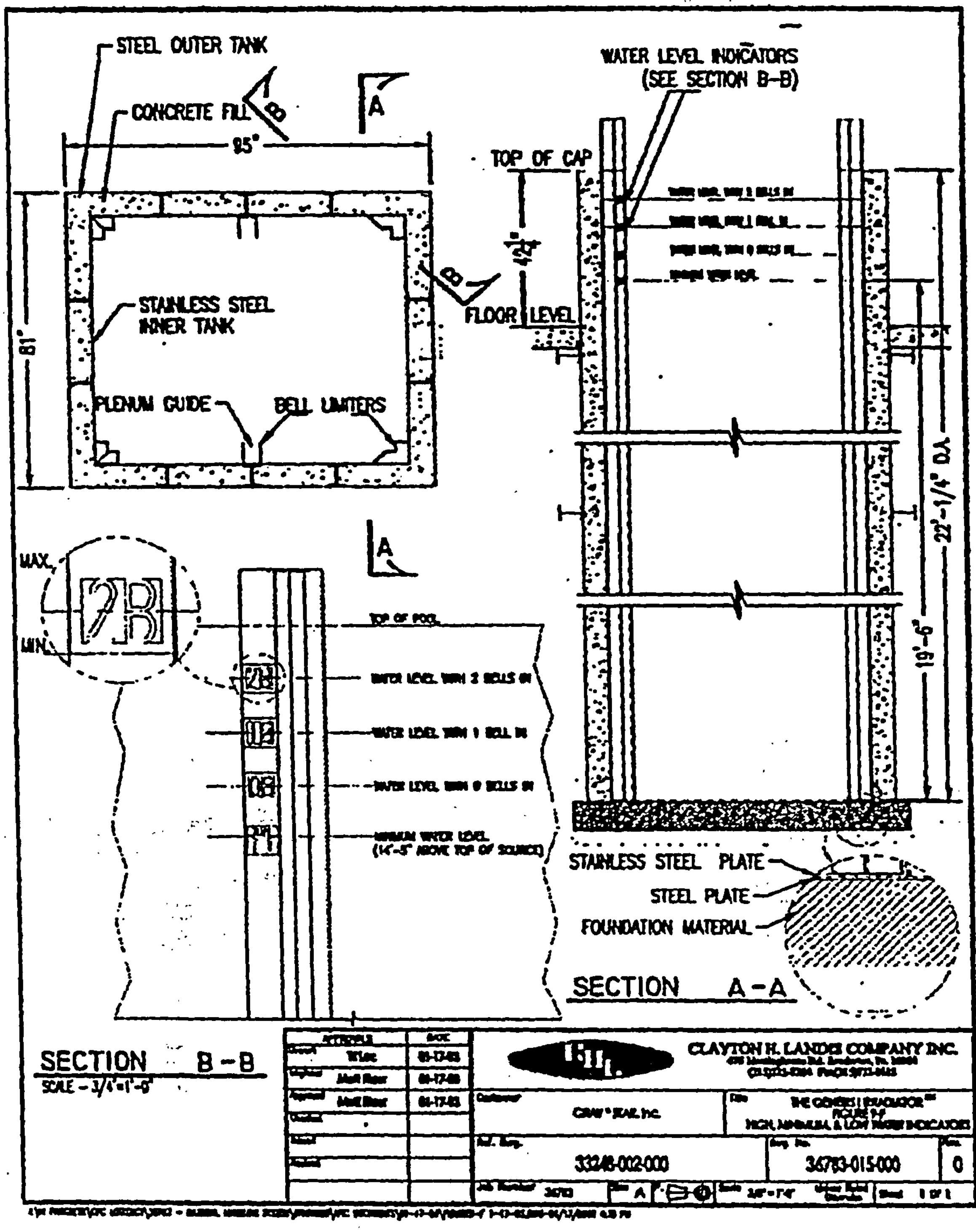
During each visit to the facility the inspector met with the applicant's management to discuss the various stages of construction of the irradiator. The inspector explained to the management NRC's procedure for review of a license application and its final disposition.

PARTIAL LIST OF PERSONS CONTACTED

Applicant

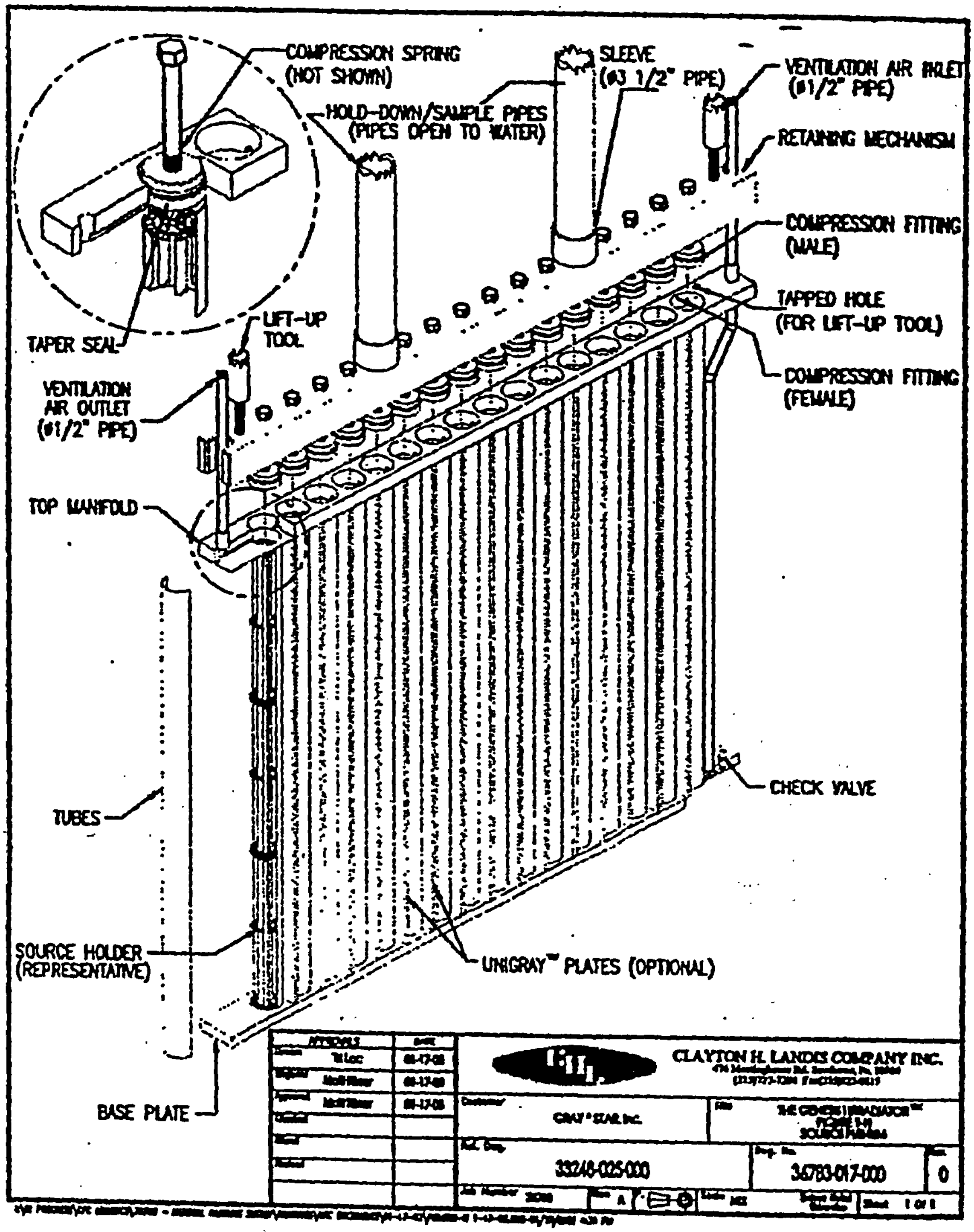
James Wood, President, CFC Logistics, Inc.
Marie Turner, Manager, Product Irradiations, CFC Logistics, Inc.
Thomas Clemens, Project Manager, CFC Logistics, Inc.
David Blattner, Irradiator Operator in Training, CFC Logistics, Inc.
Russell Stein, Vice President, Gray*Star, Inc.
Martin Stein, President/CEO, Gray*Star, Inc.
Rick Keiper, Project Manager, Clayton H. Landis Company, Inc.
Matthew Risser, Engineering Manager, Clayton H. Landis Company, Inc.
Kevin C. Landis, Engineer, Clayton H. Landis Company, Inc.
Andrew Landis, Engineer, Clayton H. Landis Company, Inc.
Joseph Paddock, Electrical Engineer, Clayton H. Landis Company, Inc.

FIGURE 1



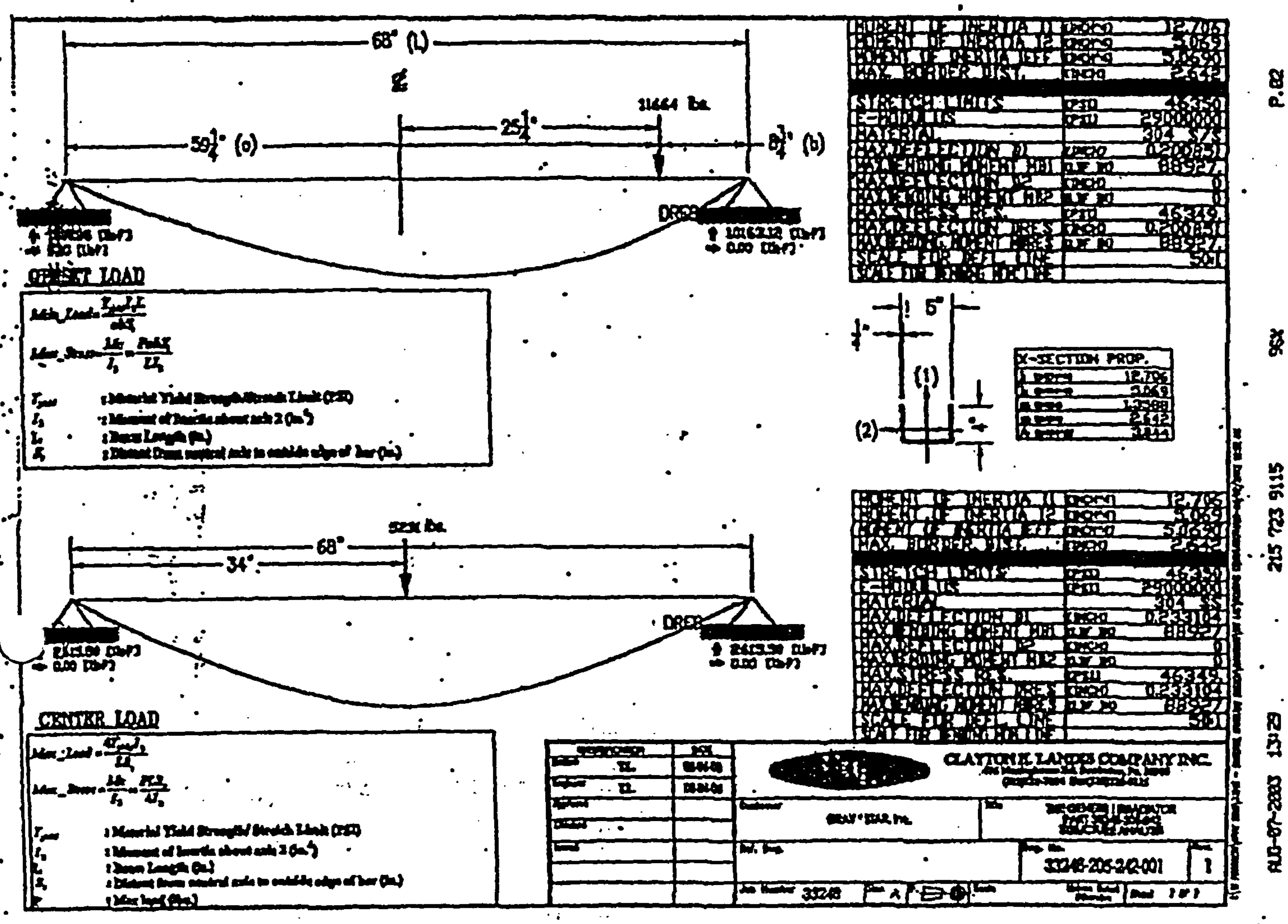
See also ML031610044

FIGURE 2



See also ML03160287

FIGURE 3



See also ML032250045

EXHIBIT C

LINDA LINGLE
GOVERNOR

RODNEY K. HARAGA
DIRECTOR

Deputy Directors
BRUCE Y. MATSUI
BARRY FUKUNAGA
BRENNON T. MORIOKA
BRIAN H. SEKIGUCHI

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
AIRPORTS DIVISION
300 Rodgers Boulevard, #12
Honolulu, Hawaii 96819-1830

IN REPLY REFER TO

AIR-O
05.0042

May 10, 2005

Mr. Michael Kohn
EQUIPMENT TEAM HAWAII
P.O. Box 31264
Honolulu, Hawaii 96820

Dear Mr. Kohn:

This is in response to your fax dated May 4, 2005, asking whether lots #011109 and 011108 are in a tsunami flood evacuation zone.

The answer is no, despite the phone book evacuation guide, which is an overly conservative plan to minimize loss of life anywhere near a coastline.

The official flood delineation document is the Federal Emergency Management's Flood Insurance Rate Map, Panel 335, a copy of which is attached. Honolulu International Airport (HNL) is shown in Zone D, undetermined but flooding possible. Note that HNL is not in Zones V or VE, which relate to coastal hazards.

The eastern edge of lot 011108 is located at an elevation of 7.7' above Mean Sea Level (MSL) and 450' west of the edge of Keehi Lagoon. Lots 011108 and 011109 are located 2,250' from the southern shoreline of Mamala Bay. The Reef Runway at elevation +10' MSL is protecting all of South Ramp, HNL.

The south shore of Oahu has never sustained more than a 3' wave from any tsunami since 1837. Earthquakes since that time have occurred on Maui and in and around the Big Island of Hawaii but not on Oahu. thus we are in seismic Zone 2A while the Big Island is in Zone 4.

Tsunami and hurricane vulnerability studies have been done for Hawaii in 1977, 1985 and 1991 with another to be started soon. A hurricane from the southwest was the worst-case scenario which generated a significant storm surge at the entrance to Pearl harbor and flooding in Hickam AFB and the runway safety area of the Reef Runway. HNL would shift into a protective, non-operational status at the point where the winds exceeded 50 knots per hour.

Our Environmental Impact Statement of August 1991 concludes a section on Natural Hazards with the statement that "It is not likely that high waves, a tsunami or a hurricane would affect the project sites covered within this EIS." The project sites included South Ramp Development.

If you have any questions, please contact me at 836-6533.

Sincerely,

BENJAMIN R. SCHLAPAK
Manager
Oahu District Airports

Enclosure