



UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION IV

611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-8064

July 8, 1997

Ray Brisnehan
Corporate Radiation Safety Officer
BJ Services Company, U.S.A
P.O. Box 4442
Houston, Texas 77210

SUBJECT: RESPONSE TO NRC INSPECTION REPORT 030-19037/97-01 AND NOTICE
OF VIOLATION

Dear Dr. Brisnehan:

Thank you for your letter dated May 6, 1997, in response to our Notice of Violation (Notice) dated April 18, 1997. We have reviewed your reply and find that no further information is needed at this time regarding the violations described in the Notice. We will review the implementation of your corrective actions during a future inspection to determine that full compliance has been achieved and will be maintained.

Should you have any questions concerning this letter please contact Mr. Mark R. Shaffer at (817) 860-8287 or the undersigned at (817) 860-8191.

Sincerely,

D. Blair Spitzberg, Ph.D., Chief
Nuclear Materials Inspection and
Fuel Cycle/Decommissioning Branch

Docket: 030-19037
License: 42-19649-01

cc: Texas Radiation Control Program Director

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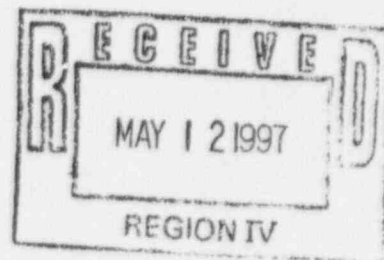
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May 6, 1997

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555



Copy to:

Regional Administrator, Region IV
611 Ryan Plaza Drive, Suite 400
Arlington, Texas 76011

Docket No.: 30-19037
License No.: 42-19649-01

RE: NRC INSPECTION REPORT 030-19037/97-01 and NOTICE OF VIOLATION

SUBJECT: REPLY TO NOTICE OF VIOLATION

A. 10 CFR 20.1101(c) requires that the licensee periodically (at least annually) review the radiation safety program content and implementation.

Contrary to the above, between January 1994 and January 1997, the licensee did not review the radiation safety program content and implementation.

REPLY: The licensee, BJ Services Company, U.S.A., operates a radiation safety program that includes nine (9) radioactive materials licenses in fifteen (15) states for forty one (41) storage locations. The radiation safety program content and implementation were reviewed on a continuing basis and the program was updated and improved when such action was indicated.

The licensee did not formally *document* that periodic reviews had taken place. The licensee has added a procedure to the **BJ Services Radiation Protection Manual** that calls for reviews at intervals not to exceed 12 months, with *documentation* of recommendations and implementations, and record maintenance by the Corporate Radiation Protection Officer. A formal review of the radiation safety program was held by the responsible company officials on January 30, 1997. The periodic review of the program is now a calendar item and it will be held each January as a matter of business. Full compliance has been achieved as of this date.

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- B. 10 CFR 20.1501 requires that each licensee make or cause to be made surveys that may be necessary for the licensee to comply with the regulations in Part 20 and that are reasonable under the circumstances to evaluate the extent of radiation levels, concentrations or quantities of radioactive materials, and the potential radiological hazards that could be present.

Pursuant to 10 CFR 20.1003, survey means an evaluation of the radiological conditions and potential hazards incident to the production, use, transfer, release, disposal, or presence of radioactive material or other sources of radiation.

10 CFR 20.1301(a)(1) requires, in part, that the licensee conduct operations so that the total effective dose equivalent to individual members of the public from licensed operations dose not exceed 0.1 rem (1 millisievert) in a year, exclusive of the dose contribution from background radiation.

Contrary to the above, as of January 29, 1997, the licensee had not made surveys to assure compliance with 10 CFR 20.1301(a)(1), which limits the total effective dose equivalent to individual members of the public from licensed operations dose not exceed 0.1 rem (1 millisievert) on a year.

REPLY: The licensee uses only one type of radioactive material, portable nuclear density gauges containing Cesium - 137 in sealed source form. The gauges come in three sizes, 50 millicuries (1.85 gigabecquerels), 100 millicuries (3.7 gigabecquerels), and 200 millicuries (7.4 gigabecquerels). The gauges are shielded by their manufactures to eliminate harmful emission levels of gamma radiation. The gauges are leak tested every six months to assure that neither alpha nor beta radiation is escaping from the sealed source. The gauges are surveyed on a regular basis to establish the amount of gamma radiation being emitted in determining the transport index (TI) to be indelibly marked on each DOT Radioactive Yellow II labels affixed to each gauge for purposes of transportation.

The licensee has determined from monitoring and surveys that a worst case scenario would be that a sealed source emit 0.009 millisieverts per hour (0.9 mR/h) at one meter from the source - a transport index of 0.9. Further, that the worst case scenario would have a member of the public exposed to a sealed source at a distance of one meter for 0.5 hours per month.

$$\begin{aligned}(0.5 \text{ hr/mo})(12 \text{ months/year}) &= 6.0 \text{ hours per year} \\ (0.009 \text{ mSv/hr})(6.0 \text{ hours/year}) &= 0.054 \text{ mSv per year}\end{aligned}$$

0.054 millisievert (5.4 millirem) per year is below the total effective dose equivalent limits to individual members of the public from licensed operations of not exceeding 1 millisievert (0.1 rem) in a year.

The worst case scenario is derived from the experience of using portable nuclear density gauges in the oilwell servicing industry for over twenty years. Surveys, monitoring and leak tests of these nuclear gauges have proven the effectiveness of the shielding and the lack of hazardous radiation to both employees who handle the devices and to individual members of the public. Full compliance has been achieved as of this date.

Sincerely,

A handwritten signature in cursive script that reads "Ray Brisnehan".

Ray Brisnehan,
Corporate Radiation Protection Officer

cc: Charles L. Smith - The Woodlands, TX