NOTICE OF VIOLATION

AND

PROPOSED IMPOSITION OF CIVIL PENALTIES

C-E Glass, Incorporated
A Division of Combustion
Engineering, Incorporated
St. Louis, MO 63147

Docket No. 030-05165
License No. 24-13998-01
EA 86-51

During a special safety inspection conducted on February 11 through March 6, 1986, two violations of NRC requirements were identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," 10 CFR Part 2, Appendix C (1985), the Nuclear Regulatory Commission proposes to impose civil penalties pursuant to Section 234 of the Atomic Energy Act of 1954, as amended, ("Act"), 42 U.S.C. 2282, PL 96-295, and 10 CFR 2.205. The particular violations and associated civil penalties are set forth below:

A. 10 CFR 30.41(a) provides that no licensee may transfer byproduct material to any person or entity except as specifically authorized in Section 30.41(b).

Contrary to the above, on October 2, 1981, C-E Glass, Incorporated, the licensee, transferred a Robertshaw Model 770-A5 source holder (gauge) containing a nominal 1.2 curie cobalt-60 sealed source to Hordis Brothers, Incorporated, an entity not authorized to receive this byproduct material under terms of 10 CFR 30.41(b).

B. 10 CFR 30.34(f) (1981) [now codified as 10 CFR 30.36(b)] requires that each licensee notify the Commission in writing when the licensee decides to terminate all activities involving materials authorized under the license.

Contrary to the above, on October 2, 1981, the licensee, C-E Glass, Incorporated terminated all activities involving materials authorized under the license when it sold its facilities located at 81 Angelica Street, St. Louis, Missouri, the only place where the licensee was authorized to use such materials under its license, and did not notify the Commission.

Collectively, the above violations have been categorized as a Severity Level III problem (Supplement VI).

(Cumulative Civil Penalties - $15,000 - assessed equally between the violations).

Pursuant to the provisions of 10 CFR 2.201, Combustion Engineering, Incorporated is hereby required to submit to the Director, Office of Inspection and Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555 with a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region III, 799 Roosevelt Road, Glen Ellyn, IL 60137 within 30 days of the date of this Notice a written statement or explanation, including for each alleged violation: (1) admission or denial of the alleged violation; (2) the reasons for the violation if admitted; (3) the corrective steps that have been taken and the results achieved; (4) the corrective steps which will be taken to avoid further

violations; and (5) the date when full compliance will be achieved. Consideration may be given to extending the response time for good cause shown. Under the authority of Section 182 of the Act, 42 U.S.C. 2232, this response shall be submitted under oath or affirmation.

Within the same time as provided for the response required above under 10 CFR 2.201, Combustion Engineering, Incorporated may pay the civil penalties by letter addressed to the Director, Office of Inspection and Enforcement, with a check, draft, or money order payable to the Treasurer of the United States in the cumulative amount of Fifteen Thousand Dollars ($15,000) or may protest imposition of the civil penalties in whole or in part by a written answer addressed to the Director, Office of Inspection and Enforcement. Should Combustion Engineering, Incorporated fail to answer within the time specified, the Director, Office of Inspection and Enforcement, will issue an order imposing the civil penalties in the amount proposed above. Should Combustion Engineering, Incorporated elect to file an answer in accordance with 10 CFR 2.205 protesting the civil penalties, such answer may: (1) deny the violations listed in this Notice in whole or in part; (2) demonstrate extenuating circumstances; (3) show error in this Notice; or (4) show other reasons why the penalties should not be imposed. In addition to protesting the civil penalties in whole or in part, such answer may request remission or mitigation of the penalties.

In requesting mitigation of the proposed penalties, the five factors addressed in Section V.B of 10 CFR Part 2, Appendix C should be addressed. Any written answer in accordance with 10 CFR 2.205 should be set forth separately from the statement or explanation in reply pursuant to 10 CFR 2.201 but may incorporate parts of the 10 CFR 2.201 reply by specific reference (e.g., citing page and paragraph numbers) to avoid repetition. The attention of Combustion Engineering, Incorporated is directed to the other provisions of 10 CFR 2.205, regarding the procedure for imposing civil penalties.

Upon failure to pay any civil penalties due which has been subsequently determined in accordance with the applicable provisions of 10 CFR 2.205, this matter may be referred to the Attorney General, and the penalties, unless compromised, remitted, or mitigated, may be collected by civil action pursuant to Section 234c of the Act, 42 U.S.C. 2282.

FOR THE NUCLEAR REGULATORY COMMISSION

James G. Keppler
James G. Keppler
Regional Administrator

Dated at Glen Ellyn, Illinois,
this 30th day of June 1986.

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 030-05165/86001(DRSS)

Docket No. 03005165

License No. 24-13998-01 Category K Priority 7

Licensee: C-E Glass, Incorporated
A Division of Combustion
Engineering, Incorporated
88 Angelica Street
St. Louis, MO 63147

Inspection Conducted: February 11 through March 6, 1986

Inspection At: 81 Angelica Street
St. Louis, MO (Currently, Broadway Salvage Company Property)
Branch Street Scales)
820 Branch Street) Office of Broadway Salvage Company
St. Louis, MO 63147)

Hordis Brothers, Incorporated
Highway M East
Truesdale, MO 63381

Classic Carriage and Car Company
1600 Heritage Landing
St. Charles, MO 63301

749 O'Brecht Lane
O'Fallon, MO 63366

Christian Hospital, NE
11133 Dunn Street
St. Louis, MO 63136

Inspectors: S. R. Lasuk
Radiation Specialist

3/17/86
Date

M. A. Kunowski
M. A. Kunowski
Radiation Specialist

3/18/86
Date

Reviewed By: D. J. Sreniawski, Chief
Nuclear Materials Safety
Section 2

D J Sreniawski

3/19/86
Date

Approved By: W. L. Axelson, Chief
Nuclear Materials Safety and
Safeguards Branch

W L Axelson

3/21/86
Date

Inspection Summary

Inspection conducted February 11 through March 6, 1986 (Report No. 030-05165/86001(DRSS))

Areas Inspected: Special safety inspection conducted to determine the disposition of licensed material which the licensee, who sold its facility and equipment, had possessed. The inspection included visits to the licensee's former site plus interviews with former employees and individuals employed by subsequent owners.

Results: Two violations were identified:

1. Unauthorized transfer of licensed material, 10 CFR 30.41(a) and (b);

2. Failure to notify the NRC that licensed activities were permanently discontinued, 10 CFR 30.34(f). (The requirement is currently contained in 10 CFR 30.36(b)).

DETAILS

1. Persons Contacted

Former C-E Glass/Hordis Brothers Employees

Warren Kempa, Production Manager/Plant Manager
Oscar L. Luebbert, Production Superintendent
Albert H. Belz, Plant Manager (before Kempa)
Paul J. Schmitt, Plant Engineer, St. Louis/Warrenton
Gerald F. Hertel, Maintenance Supervisor
Verlin Sutton, Supervisor, Hot End
Merle Haynes, Swing Foreman, Hot End

Broadway Salvage Company

Jack Ballard, Owner

Porter's Engineering and Demolition

George Porter, Owner (also works for Broadway Salvage Company)

Former National Industrial Services, Incorporated (Auctioneers) Employees

Cathy Henry
Mark Hibbeler

Texas Nuclear Corporation

Doris Bryan, Manager, Licensing and Regulatory Affairs
Ben Mathes, Field Service Supervisor
Bill Hendrick, Chemical Engineer (runs TN's disposal service)

Combustion Engineering, Incorporated

Reynold L. Hoover, Corporate Director, Health, Safety and Environmental Control.
Gary McKay, Radiation Specialist
Nancy Wilper, Health Physics Technician

Washington University Medical Center, St. Louis, MO

Barry Siegel, M.D.

Wohl Hospital, St. Louis, MO

Shabbir Safdar, M.D.

University of Cincinnati Hospital, Cincinnati, OH

Eugene L. Saenger, M.D. (NRC Medical Consultant)

2. Licensed Program

This byproduct material license was initially issued to C-E Glass, Incorporated (CEG) on April 28, 1971. The license was amended (Amendment No. 3) on July 8, 1981, and will expire on July 31, 1986. The license authorizes the use of cobalt-60 as a sealed source (not to exceed 2.5 curies per source) in a Robertshaw Model No. 770-A5 source holder (gauge) for level measurement at the licensee's facility at 81 Angelica Street, St. Louis, MO.

The four individuals named as authorized users on the original license are the same individuals named as authorized users on the latest amendment. At this time, one of the individuals (C. J. Youngblood) is deceased, two (A. H. Belz and O. Luebbert) are retired, and one (P. J. Schmitt) is working for another organization in Texas.

3. Inspection History

There have been no previous inspections of this program.

4. Background Information

On November 20, 1985, Region III's Material Licensing Section (MLS) received a memorandum from NRC - Headquarters listing six licensees whose mail was returned to NRC as "Not Deliverable As Addressed." One of these was CEG. In an attempt to contact individuals who are, or were, associated with this licensee, MLS eventually contacted the former Production Manager (W. Kempa) for CEG St. Louis facility, on February 6, 1986. Mr. Kempa, who is currently employed by Hordis Brothers, Incorporated (HBI) in Truesdale, MO, stated that the St. Louis facility was sold, with all contents, by HBI to Broadway Salvage Company (BSC) in about 1983; he said he had no knowledge of any radioactive material licensed by the NRC. (It was subsequently determined that HBI purchased the CEG facility and equipment on October 2, 1981). On February 10, 1986, MLS notified Region III's Materials inspection staff of their unsuccessful attempts to obtain additional information regarding CEG; they requested assistance.

5. Inspection Activities

A Region III inspector initiated the followup on the CEG matter on February 11, 1986 with a telephone call to Doris Bryan, manager of licensing and regulatory affairs for Texas Nuclear (TN) (TN markets and services Robertshaw gauges). She stated that the only work TN had performed for CEG was in June 1978 when a 2.5 curie cobalt-60 source was loaded into the gauge. (She later called with a correction - the source was 2.5 curies in May 1976).

The inspector then called Mr. Jack Ballard, owner of BSC, who explained that he purchased the property from HBI in October 1984. Mr. Ballard contracted with National Industrial Services of St. Louis to auction off

equipment remaining on the property. The auction was held on November 28, 1984. Subsequently, Mr. Ballard's employees have been salvaging metal and otherwise preparing the property for sale.

The inspector also contacted Mr. Oscar Luebbert, former employee of CEG and HBI and also an authorized user of the gauge. He stated that the gauge had been taken off the furnace several years ago and he thought it was shipped to a HBI plant in Pennsylvania. (He later changed this statement when he said the shipment went to another glass facility in Cinniminson, N.J. in late 1982 or early 1983). The gauge was returned to the Angelica Street site several months later and stored in a machine shop building until the auctioneers moved it, several days before the auction, to a location near an outdoor scrap pile.

On February 19, 1986, the inspector arrived at Mr. Ballard's office at 820 Branch Street in St. Louis. Upon being shown a picture of the gauge, Individual A, one of Mr. Ballard's employees, stated that the gauge was still on an outdoor scrap pile at the site and he had worked near the gauge for several months in late 1984 and early 1985. The inspector was escorted by Mr. Ballard and Individual A to the site where they directed the inspector to the gauge location. Radiation level readings taken with a G.M survey meter* were less than 5 mR/hr at one foot from the exposed surfaces of the gauge. The shutter control knob was found in the full open position with the shutter end pointing down and into the scrap pile. The inspector moved the shutter control knob to the off position and conducted a wipe test which indicated no removable contamination. The shutter control knob was then secured with a padlock purchased by the inspector, and arrangements were made by Mr. Ballard to have TN remove the gauge. However, the gauge was eventually removed by personnel from a Combustion Engineering facility, rather than TN.

On February 20, 1986, Individual A stated he had tried to remove the stainless steel casing of the gauge and had removed a pin which held the shutter control knob in a fixed position sometime during the first two weeks in December 1984; the knob turned freely thereafter. In addition, Individual A and Individual B stated they moved the gauge several times while working near the scrap pile during the December 1984 - January 1985 period; Individual B said he actually picked up the gauge once to move it to another location. Arrangements were then made to have Individual A examined by a physician. Individual B stated he is currently under a physician's care for elevated white blood count and an intestinal fissure.

At the request of the Region III office, Mr. Reynold L. Hoover, Corporate Director of Health, Safety and Environmental Control for Combustion Engineering in Windsor, Connecticut made arrangements to have Mr. Gary McKay and Ms. Nancy Wilper of the Combustion Engineering plant in Hematite, Missouri meet the inspector at the site on February 21, 1986 to effect removal of the gauge. A shipping paper was prepared and the gauge was labelled and marked in accordance with DOT regulations. The Combustion Engineering vehicle left the site with the gauge at 3:59 p.m.. Inquiries from the media and St. Louis city officials at the site were answered by the inspector or referred to the Region III office.

*Eberline, Model E-520 Geiger Counter, NRC No. 009577, calibrated 12/3/85.

The inspectors visited the facility at 81 Angelica Street on February 25, 1986, after interviewing Individual B and Individual A at the BSC office on Branch Street earlier that day. In an attempt to determine if any other gauges may be on this ~ 6.5 acre site, the inspectors examined all of the buildings making a visual check and radiation level measurements (using Micro R Meters*). They also checked trash bins and trash/scrap piles both inside and outside of these buildings, including the scrap pile where the gauge was located during the previous week. No other gauges were found.

The inspectors met with current and former CEG/HBI employees and former auctioneers in the St. Louis area during the remainder of the week. Telephone interviews were also conducted with former employees and others to gather information that would indicate if anyone may have received a significant radiation exposure and if NRC requirements had been violated. In addition, the inspectors interviewed two individuals who had been at the auction site. Their names were given to the inspectors by National Industrial Services.

During the discussions with Individual A, the inspectors learned that the gauge remained in the area of fire barrels (barrels in which he burned wood for warmth) where he spent his morning and afternoon breaks as well as his lunch period through February 12, 1985. During these breaks from his nearby salvage activity (cutting steel I-beams for scrap), he sat on the gauge.

These daily breaks totaled from 1/2 hour to 1 1/2 hours, and he said he worked almost every day (seven days per week) during that period through February 12, 1985. He claimed his legs were sometimes over the rounded portion of the gauge and, at other times, over either end of the gauge. He also stated that he worked alone.

Individual B said he frequently visited the site and talked to Individual A during the I-beam cutting work. He further claimed he was in the vicinity of the gauge about 100 times during that period, from 15 minutes to two hours, at a distance of one foot to five or six feet from the gauge. He added that he had his hands on the gauge about 12 times, eight to ten of those times were during the November-December 1984 period; otherwise, the other times were in July-August 1985.

Based on the limited information provided by other individuals (who either had little to do with the gauge or, were unable to recall events because of the elapsed time), lack of records, plus the unavailability of input from Mr. Youngblood, the inspectors were unable to determine if anyone received a higher radiation dose than that estimated for Individual A.

The finding of the gauge on the scrap pile was reported on local television on February 21, 1986, and in the newspaper on February 22, 1986. Some of the interviewed individuals said they heard or saw the media reports.

*1. Ludlum, Model 19, Micro R Meter, NRC No. 014809, calibrated 1/24/86.
2. Eberline, Model PRM-7, Micro R/hr Meter, NRC No. 010285, calibrated 1/17/86.

In tracing the events that led to the loss of control of the licensed material, the inspectors learned that CEG sold their Angelica Street facility and equipment including the gauge to HBI on October 2, 1981. This transfer of licensed material was a violation of 10 CFR 30.41(a) and (b)(5) which requires transfers of byproduct material by a licensee to be made to persons authorized to receive byproduct material under terms of a specific license or a general license or their equivalents issued by the Atomic Energy Commission, the Nuclear Regulatory Commission, or an Agreement State. This sale also violated 10 CFR 30.34(f), (currently, 10 CFR 30.36(b)), which required each licensee to notify the Commission in writing when the licensee decides to permanently discontinue all activities involving licensed material. After the sale was completed, the licensed material was no longer under the control of the licensee. The gauge, containing the licensed material, was removed from its installed position near a furnace by HBI employees during the latter part of 1982 or early 1983. This eventually permitted the gauge to be moved to an area on the site that was accessible to certain members of the public.

6. Independent Measurements

Radiation measurements on the surface of the gauge in February 1986, ranged from 6 mR/hr to 70 mR/hr with the shutter closed. The 70 mR/hr reading was at the shutter end. Measurements taken at one foot from the shutter end with the shutter control knob in the fully open position showed a reading of 1.8 R/hr. Based on the above measurements and statements made by Individual A, the maximum radiation dose to his buttocks could have ranged from about 0.6 rem up to about 1.7 rem. While sitting on the gauge, if his leg was always in the radiation beam at a distance of one foot from the shutter end, and the shutter was in the fully open position, the maximum radiation dose to the leg could have ranged from about 69 rem up to about 208 rem. (See Attachment C).

7. Followup Action

TN representatives informed Region III on March 3, 1986 that they took possession of the source at the Combustion Engineering facility in Hematite, MO on February 28, 1986 and returned it to their facilities for disposition. After removing the source, TN wipe tested the gauge. Results indicated no removable radioactive contamination. The emptied gauge remained at the Hematite facility.

They reported that the source activity and assay date, which was stamped on the source capsule, was 2.5 curies on May 20, 1976.

On March 3, 1986, Region III telephoned Dr. Safdar who examined Individual A on February 21, 1986. Dr. Safdar indicated he has been in contact with Dr. Saenger, the NRC Medical Consultant. Dr. Saenger notified Region III on March 6, 1986 that Dr. Safdar found Individual A's blood count, bone marrow, and physical examination to be normal.

8. Enforcement Conference

An enforcement conference was held in the Region III office on March 19, 1986 with Messrs. Reynold Hoover, Corporate Safety Director, and John Brett, Corporate Counsel, for Combustion Engineering, Incorporated and Mr. A. B. Davis and others of the Region III staff. The apparent violations identified during the inspection and NRC's enforcement policy were discussed. The licensee was informed that this matter is being considered for escalated enforcement action. The licensee presented their findings and preliminary corrective action.

Attachments:
A. Requirements in Effect in 1981
B. Identification of Individuals A and B (Exempt from disclosure)
C. Dose Calculations
D. Chronology of Events, C-E Glass, Incorporated

ATTACHMENT A

Requirements in Effect in 1981

§ 30.41 Transfer of byproduct material.

(a) No licensee shall transfer byproduct material except as authorized pursuant to this section.

(b) Except as otherwise provided in his license and subject to the provisions of Paragraphs (c) and (d) of this section, any licensee may transfer byproduct material:

(5) To any person authorized to receive such byproduct material under the Commission, or an Agreement State;

§ 30.34 Terms and conditions of licensees.

(f) Each licensee shall notify the Commission in writing when the licensee decides to permanently discontinue all activities involving materials authorized under the license. This notification requirement applies to all specific licenses issued under this part and Parts 32 through 35 of this chapter.

ATTACHMENT B

Individual A - Exempt from Disclosure
Individual B - Exempt from Disclosure

ATTACHMENT C

Dose Calculations

The radiation measurements in February 1986 showed a gauge surface reading of up to 15 mR/hr, except for the shutter end which was 70 mR/hr with the shutter closed. With the shutter open, the reading in the beam at one foot from the gauge was 1.8 R/hr.

Correcting for the decay of the cobalt-60 source from 12/84 to 2/86 (~ 1.17 years), the following calculations show:

$$D_a = D_b e^{-\lambda t} = D_b e^{-\frac{.693}{T_{\frac{1}{2}}}(t)}$$

Where $D_a = 15$ mR/hr

$T_{\frac{1}{2}} = 5.26$ years for Co-60

$t = 1.17$ years

$$\text{Therefore, } D_b = \frac{D_a}{e^{-\lambda t}} = \frac{15 \text{ mR/hr}}{e^{-\frac{.693}{5.26}(1.17)}} = \frac{15 \text{ mR/hr}}{e^{-0.154}} = \frac{15 \text{ mR/hr}}{0.86}$$

$$D_b \sim 17.4 \text{ mR/hr}$$

If an individual sat on the gauge where the reading was 17.4 mR/hr, and he sat there from 1/2 hour to 1 1/2 hours per day for 66 days during the December 1984 to February 1985 period, the maximum radiation dose range to his buttocks can be estimated as follows:

17.4 mR/hr x 0.5 hr/day x 66 days = 574 mR or ~ 0.6 rem
and 17.4 mR/hr x 1.5 hrs/day x 66 days = 1,723 mR or, ~ 1.7 rem

Because of the construction of the gauge, it is unlikely that he would have sat on the shutter end.

Correcting for the decay of the source in regard to the open shutter reading,

$$D_c = D_d e^{-\lambda t} = D_d e^{-\frac{.693}{5.26}(1.17)}$$

where $D_c = 1.8$ R/hr

$$\text{Then, } D_d = \frac{D_c}{e^{-\lambda t}} = \frac{1.8 \text{ R/hr}}{0.86}$$

$$D_d \sim 2.1 \text{ R/hr}$$

If an individual's leg was in the radiation beam at a distance of one foot from the shutter end, with the shutter in the fully open position, and his leg was there from 1/2 hour to 1 1/2 hours per day for 66 days during the December 1984 to February 1985 period, the maximum radiation dose range to his leg could be estimated as follows:

2.1 R/hr x 0.5 hr/day x 66 days = 69.3 R or, ~ 69 rem
and 2.1 R/hr x 1.5 hrs/day x 66 days = 207.9 R or, ~ 208 rem

ATTACHMENT D

Chronology of Events

C-E GLASS, INCORPORATED
Docket No. 030-05165

April 28, 1971	License granted for one 2.5 Ci cobalt-60 source for use in a Robertshaw Model 770-A5 source holder for level measurement.
June 9, 1978	New cobalt-60 source loaded into holder (gauge) by Texas Nuclear; source was 2.5 Ci in May 1976.
October 2, 1981	Facility and equipment of C-E Glass, Inc. sold to Hordis Brothers, Incorporated.
May 1982	Hordis Brothers, Incorporated ceased operations at this facility.
Late 1982 - Early 1983	Gauge was removed from furnace by employees of Hordis Brothers, Incorporated, packaged and then shipped to a glass facility in Cinniminson, New Jersey.
2-3 months later	Gauge was returned to the Hordis Brothers, Incorporated facility in St. Louis, Missouri and stored in original shipping package.
October 1984	Hordis Brothers, Incorporated sold facility and equipment to Broadway Salvage.
Late November 1984	Gauge was removed from shipping package by employees of an auction company and subsequently moved to the vicinity of a scrap pile at the facility.
Early December 1984	Locking mechanism on gauge shutter control was removed by employee of Broadway Salvage. Removal of stainless steel casing was also attempted. Activity of source estimated as 0.81 Ci.
Early December 1984 to mid-February 1985	Two employees of Broadway Salvage handled gauge and worked in vicinity of gauge.
April-May 1985	Gauge moved to scrap pile.
February 19, 1986	Gauge relocated by NRC inspector with assistance of Broadway Salvage employees.
February 21, 1986	Gauge removed by employees of Combustion Engineering to Hematite, Missouri facility.