

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

1110 Chestnut Street Tower II

December 7, 1982



Division of Fuels and Materials Safety
Office of Nuclear Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Mr. Paul Guinn, Materials Branch, Division of
Materials and Fuels Cycle Licensing

Gentlemen:

RAPID SULFUR METER (RSM) - CONTINUOUS ONLINE ANALYZER OF COAL (CONAC)
BYPRODUCT MATERIAL LICENSE 41-08165-12 REQUEST FOR AMENDMENT NO. 3

Pursuant to the guidelines set by the Code of Federal Regulations (CFR)
Title 10, Part 30, Section 30.38, we request that our byproduct material
license No. 41-08165-12 be amended as indicated below.

Condition 12:

Due to personnel changes, the names Mike Boyles and Michael W. DeLawson
(resumes enclosed) should be added and R. N. Campbell deleted.

If you have any questions or require further information, please contact
Gary MacDonald, 1110 Chestnut Street Tower II, Chattanooga, Tennessee 37401,
telephone FTS 858-5675.

Sincerely,

J. B. Brellenthin
Supervisor, Environmental Support

Enclosures

FEE EXEMPT

34-19063

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NMSS LIC30
41-08165-12 PDR

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DESCRIPTION OF TRAINING AND EXPERIENCE

NAME: Michael W. DeLawson

EDUCATION/TRAINING: Associate Degree in Engineering, Bachelor of Science degree in electrical engineering.

EXPERIENCE: Two years as Electrical Engineer, Electrical Maintenance, Tennessee Valley Authority. Two years as Instrument Engineer, Power Plant Results Section, Tennessee Valley Authority.

PRESENT DUTIES: Overseeing initial startup of Flue Gas Desulfurization System for units 1 and 2, Paradise Steam Plant, Tennessee Valley Authority.

11/15/82
SWC:JKA

DESCRIPTION OF TRAINING AND EXPERIENCE

NAME: Mike Boyles

EDUCATION/TRAINING:

Health Physics Training and orientation at Power Operations Training Center, Tennessee Valley Authority (TVA).

Performed radiation survey and wipe test with K-Ray Service Engineer, 1981, and TVA Radiological Hygiene Branch, 1982, at Paradise Steam Plant.

EXPERIENCE:

Approximately 11 years as Instrument Mechanic, Senior Instrument Mechanic, and Senior Instrument Mechanic Instructor Foreman, and Engineering Associate at TVA.

Approximately three years as Instrument Engineer at Paradise Steam Plant, TVA.

PRESENT DUTIES: Instrument Engineer, Paradise Coal-Washing Plant, TVA.

SWC:JKA
11/15/82

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO: NR-590-D-101-S

DATE: JUN 3 1982

PAGE:

1

OF:

DEVICE TYPE: Neutron and Gamma Gauge

MODEL: CONAC (Nuclear Analyzer of Coal)

MANUFACTURER/DISTRIBUTOR:

Science Applications, Inc.
Sunnvale, CA

MANUFACTURER/DISTRIBUTOR:

SEALED SOURCE MODEL DESIGNATION:

- A. USDOE - Savannah River Model SR-CF-100
- B. Texas Nuclear Model 570-57157C
- C. Texas Nuclear Model 570-57157C

ISOTOPE:

- A. Californium-252
- B. Cesium-137
- C. Cesium-137

MAXIMUM ACTIVITY:

- A. 165-micrograms
- B. 100 millicuries
- C. 200 millicuries

330 - per S Baggett 3/29/83
177 on Ce - per S Baggett 3/29/83
(178 millicuries)

LEAK TEST FREQUENCY:

6 Month intervals

PRINCIPAL USE:

Other

CUSTOM REVIEW:

X YES

 NO

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO: NR-590-D-101-S

DATE: JUN 3 1962

PAGE: 2 OF:

DEVICE TYPE: Neutron and Gamma Gauge

CUSTOM REVIEW: TVA
Division of Energy Demonstrations & Tech.
11110 Chestnut Street Tower II
Chattanooga, TN 37401

DESCRIPTION:

The CONAC (continuous nuclear analyzer of coal) is a custom device manufactured, tested and installed by Science Applications, Inc. for use by TVA at its coal washing plant Drakesboro, KY. The device is intended to determine total elemental analysis of coal by prompt neutron activation. Neutrons are provided by a 165 microgram Cf-252 source manufactured by DOE Savannah River (Model SR-CF-100). The CONAC Device Measures 25 feet long by 14 feet high at the input hopper and weighs about 14 tons. As indicated in the conceptual drawing (enclosure 1), coal enters the system through the input hopper and is gravity fed and leveled to an uniform depth by an adjustable gate. The coal passes through a gauging system which determines moisture content and then through an area where it is irradiated by the Cf-252 source which is located below the conveyor belt. Gamma detectors located above measure radiation from the activated coal. A computer then determines coal constituent analysis. Irradiated coal is returned.

The CONAC also employs two cesium-137 sources (Texas Nuclear Model 570-57157C) for use in gauging devices which measure coal level and mass flow rates. These sources are used in Texas Nuclear Models 5196 level gauge and 5034 belt weigh scale. Each of these gamma gauging devices have been approved for licensing purposes by the State of Texas.

LABELING:

Device will be labeled in accordance with the provision of Section 20.203, 10 CFR Part 20.

DIAGRAM:

See Enclosures 1 and 2.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO: NR-590-D-101-S

DATE: JUN 3 1962

PAGE: 3 OF:

DEVICE TYPE: Neutron and Gamma Gauge

CONDITIONS OF NORMAL USE:

This device is permanently installed in a coal washing plant. Expected environmental conditions are:

- ° Temperature range: 32°F to 100°F
- ° Vibration: none expected. The device will be isolated from any source of vibration.
- ° Corrosion: None expected. The device will be installed in a protected environment.
- ° Impact. None expected.
- ° Explosion: Low probability. The coal to be analyzed is wet and all electrical wiring explosion proof.
- ° Fire: The probability of fire is low. However, the use area will be equipped with a sprinkler system.

PROTOTYPE TESTING:

The CONAC is a custom device designed and manufactured by Science Applications, Inc. for TVA. The device will be assembled and fully tested in the manufacturers facilities and then shipped to TVA where it will be installed and tested by the manufacturer and TVA.

EXTERNAL RADIATION LEVELS:

The CONAC gauging system contains three device source housings. These are: (1) Texas nuclear level gauge model 5196, (2) Texas nuclear weigh scale model 5034 and (3) Science Applications CONAC neutron analyzer. Maximum anticipated radiation levels from each are not expected to exceed:

- 1) Level gauge - .25 mrem/hr at 1 foot from the device
- 2) Weigh scale - .08 mrem/hr at 1 foot from the device surface
- 3) CONAC - 6 mrem/hr at surface
for normal operating conditions source exposed coal
in unit (for 400 microgram loading)
- CONAC - 45 mrem/hr at surface of device for source exposed
no coal in (For 400 microgram loading)

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO: NR-590-D-101-S

DATE: JUN 3 1982

PAGE: 4 OF:

DEVICE TYPE: Neutron and Gamma Gauge

SAFETY ANALYSIS SUMMARY:

The CONAC device is custom designed and built by Science Application, Inc. for use by TVA in its coal washing plant at Drakesboro, KY. The device is intended to determine total elemental composition of coal by neutron activation. The device also includes a nuclear level gauge and a mass flow gauge each of which contain gamma sources. These gamma gauging devices are manufactured by Texas Nuclear and have already been accepted for licensing by the State of Texas.

Based on the ANSI performance classification for the sealed neutron source and the anticipated environmental conditions to which it is likely to be subjected, we expect the source to retain containment integrity.

According to the manufacturer, the CONAC is designed to limit external surface radiation levels at accessible areas to less than 10 mrem/hr for normal operations.

Finally, the CONAC design is labeled in accordance with Section 20.203, 10 CFR Part 20 and includes a fail safe "on-off" mechanism, with warning lights to show source position. Also, to protect against fire or explosion TVA will provide sprinkler protection and non-spark type wiring for the area in which the device will be used.

Based on the above considerations and our review of the information and test data contained in the references cited below, we conclude that the CONAC device is acceptable for custom licensing to TVA.

LIMITATIONS AND/OR OTHER CONSIDERATION OF USE:

- ° The CONAC shall be distributed only to the specific licensee referred to in this document (TVA).
- ° The device manufacturer shall install and initially test and inspect the CONAC for proper operation of the source exposure mechanism, safety system and radiation shielding. In addition the manufacturer shall insure that required radiation warning labels and signals are installed, leak tests of the sources have been performed and initial radiation surveys for sources exposed and sources shielded are performed.
- ° Sealed source contained in the CONAC shall be leak tested at six month intervals using techniques capable of detecting 0.005 microcurie of removable contamination.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO: NR-590-D-101-S

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OF:

DEVICE TYPE: Neutron and Gamma Gauge

REFERENCES:

The following supporting documents for the CONAC gauging device are hereby incorporated by reference and are made a part of this registry document.

- ° TVA application dated November 9, 1981
- ° TVA letters dated March 9, 1982 and April 29, 1982.

ISSUING AGENCY:

U.S. Nuclear Regulatory Commission

Date: JUN 3 1982

Reviewer

Earl G. Wright
Earl G. Wright

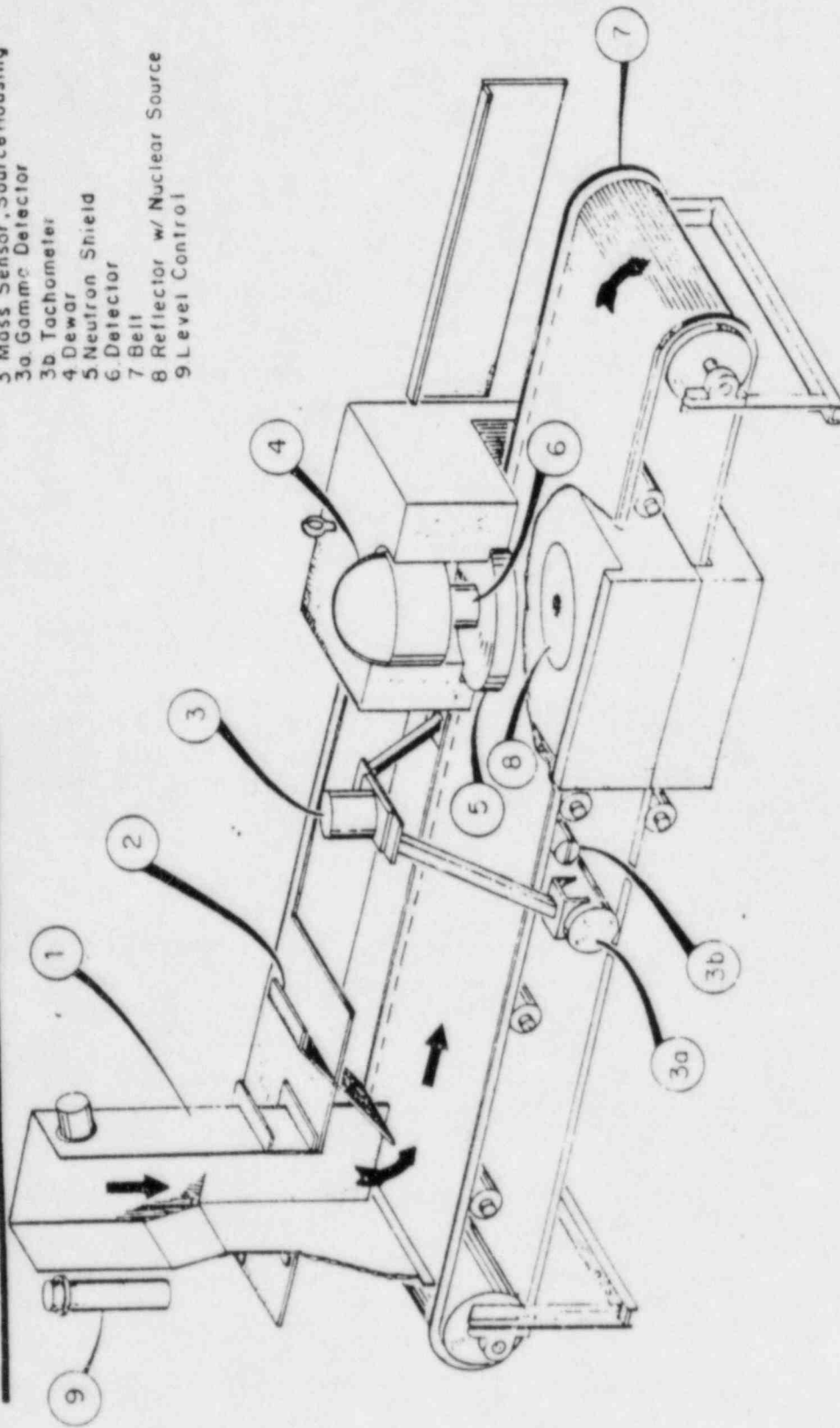
Date: JUN 3 1982

Concurrence

Bernard Singer
Bernard Singer

CONCEPTUAL CONAC

- 1 Feed Surge Bin
- 2 Adjustable Gate
- 3 Mass Sensor, Source Housing
- 3a Gamma Detector
- 3b Tachometer
- 4 Dewar
- 5 Neutron Shield
- 6 Detector
- 7 Belt
- 8 Reflector w/ Nuclear Source
- 9 Level Control



CONCEPTUAL CONAC

- 1. Feed Surge Bin
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- 8. Reflector w/ Nuclear Source
- 9. Level Control

