FLORIDA POWER CORPORATION
CRYSTAL RIVER UNIT 3
DOCKET NO. 50-302/LICENSE NO. DPR-72
REQUEST NO. 36, SUPPLEMENT 1

RADIOLOGICAL EFFLUENT TECHNICAL SPECIFICATIONS

DOCUMENTS INVOLVED: Technical Specification (Appendix A)
Radiological Effluent
Technical Specifications
(TSCRN 36)

PORTION(S): Table 3.3-6 Radiation Monitoring Instrumentation
Table 4.3-3 Radiation Monitoring Instrumentation Surveillance Requirements
3.3.3.9 Radioactive Gaseous Effluent Monitoring Instrumentation
Table 3.3-13 Radiation Gaseous Effluent Monitoring Instrumentation
Table 4.3-9 Radiation Gaseous Effluent Monitoring Instrumentation Surveillance Requirements

DESCRIPTION OF REQUEST:

Delete the requirements for the "Reactor Building" (RM-A1) and the "Auxiliary and Fuel Handling Area" (RM-A2) effluent monitors from Table 3.3-6 and Table 4.3-3.

Add the operability and surveillance requirements for the mid and high ranges of RM-A1 and RM-A2 to Table 3.3-13 and Table 4.3-9.

REASON FOR REQUEST:

The first changes described above are primarily editorial changes. The Radiological Effluent Technical Specifications (3.3.3.9) address the operability and surveillance requirements for RM-A1 and RM-A2, thus these requirements should be deleted from Technical Specification 3.3.3.1. Specification 3.3.3.9 is a more appropriate location for these requirements because it specifically deals with effluent monitors.

The operability and surveillance requirements of the mid and high ranges of RM-A1 and RM-A2 are being added due to an NRC required plant modification. NUREG-0737, Item II.F.1, Attachment 1 requires that noble gas effluent monitors shall be installed with an extended range designed to function during accident and normal conditions. By December 31, 1983, Florida Power Corporation will complete the installation of a mid and high range noble gas effluent monitor for the Reactor Building and for the Auxiliary and Fuel Handling Area. NUREG-0737 also requires that these new monitors be included in the Technical Specifications.

EVALUATION OF REQUEST:

The first changes described are primarily editorial in nature. The operability and surveillance requirements for RM-A1 and RM-A2 are adequately addressed in Specification 3.3.3.9. Furthermore, these requirements have been discussed with the staff and are apparently adequate.

The mid and high ranges of RM-A1 and RM-A2 are provided to monitor large releases of radioactive materials in gaseous effluents under accident conditions as well as normal operating conditions. When the range of measurement on the normal and mid-range units are exceeded, valves isolate the lower range instruments to prevent excessive contamination and over-range damage to the sub-system. As the concentration returns towards normal levels, the more sensitive lower range sub-systems will be reactivated by appropriate valve actuation. This system meets the technical requirements of NUREG-0737, item II.F.1.1.

The operability and surveillance requirements for the mid and high ranges will ensure that these monitors will be available for information during and following an accident. A source check, utilizing an internal check source, will be performed daily to verify a qualitative response to radiation. A monthly CHANNEL FUNCTIONAL TEST will be performed using the check source to verify alarm actuation. A CHANNEL CALIBRATION shall be performed every refuel.

When one or more of the mid and high range monitors are inoperable, one is required to exert best efforts to return the instrument to OPERABLE status within 30 days. If these monitors are inoperable, Florida Power Corporation does have the capability to sample these areas using the on-line isotopic analysis unit or the grab sample station.

## TABLE 3.3-6

## RADIATION MONITORING INSTRUMENTATION

| | INSTRUMENT | MINIMUM CHANNELS OPERABLE | APPLICABLE MODES | ALARM/TRIP SETPOINT | MEASUREMENT RANGE | ACTION |
|---|---|---|---|---|---|---|
| 1. | AREA MONITORS | | | | | |
| | a. Fuel Storage Pool area | | | | | |
| | i. Criticality Monitor | 1 | * | ≤ 15 mr/hr | $10^{-1}$-$10^{4}$ mr/hr | 14 |
| 2. | PROCESS MONITORS | | | | | |
| | a. Reactor Building | | | | | |
| | i. Gaseous Activity-RCS Leakage Detection | 1 | 1,2,3,4 | Not Applicable | $10^{1}$-$10^{6}$ cpm | 15 |
| | ii. Iodine Activity-RCS Leakage Detection | 1 | 1,2,3,4 | Not Applicable | $10^{1}$-$10^{6}$ cpm | 15 |
| | b. Control Room | | | | | |
| | i. Iodine Activity-Ventilation System Isolation/ Recirculation | 1 | All Modes | ≤ 2 x background | $10^{1}$-$10^{6}$ cpm | 18 |

* With fuel in the storage pool or building

## 3/4.3.3.8 RADIOACTIVE LIQUID EFFLUENT INSTRUMENTATION

The radioactive liquid effluent instrumentation is provided to monitor and control, as applicable, the releases of radioactive materials in liquid effluents during actual or potential releases of liquid effluents. The alarm/trip setpoints for these instruments shall be calculated in accordance with the procedures in the OFFSITE DOSE CALCULATION MANUAL (ODCM) to ensure that the alarm/trip will occur prior to exceeding the limits of 10 CFR Part 20. The OPERABILITY and use of this instrumentation is consistent with the requirements of General Design Criteria 60, 63 and 64 of Appendix A to 10 CFR Part 50.

## 3/4.3.3.9 RADIOACTIVE GASEOUS EFFLUENT INSTRUMENTATION

The radioactive gaseous effluent instrumentation is provided to monitor and control, as applicable, the releases of radioactive materials in gaseous effluents during actual or potential releases of gaseous effluents. The alarm/trip setpoints for these instruments are calculated in accordance with the procedures in the OFFSITE DOSE CALCULATION MANUAL (ODCM) to ensure that the alarm/trip will occur prior to exceeding the limits of 10 CFR Part 20. The OPERABILITY and use of this instrumentation is consistent with the requirements of General Design Criteria 60, 63 and 64 of Appendix A to 10 CFR Part 50.

The mid and high ranges of RM-A1 and RM-A2 are provided to monitor large releases of radioactive materials in gaseous effluents under accident conditions as well as normal operating conditions. When the range of measurement on the normal and mid-range units are exceeded, valves isolate the lower range instruments to prevent excessive contamination and over-range damage to the sub-system. As the concentration returns towards normal levels, the more sensitive lower range sub-systems will be reactivated by appropriate valve actuation. This system meets the technical requirements of NUREG-0737, item II.F.1.1. The alarm setpoints for these units are calculated in accordance with the applicable system procedure.

## 3/4.3.3.10 WASTE GAS DECAY TANK - EXPLOSIVE GAS MONITORING INSTRUMENTATION

The OPERABILITY of the Waste Gas Decay Tank explosive gas monitoring instrumentation or the sampling and analysis program required by this specification provides for the monitoring (and controlling) of potentially explosive gas mixtures in the Waste Gas Decay Tanks.

DRAFT

REQUEST NO. 36, SUPPLEMENT 2

**Radiological Effluent Technical Specification**

LICENSE DOCUMENTS INVOLVED:

Technical Specifications (Appendix A)

Radiological Effluent Technical Specification (TSCRN 36)

| | | |
|---|---|---|
| PORTIONS: | Table 3.12-1: | Operational Radiological Environmental Monitoring Program |
| | Table 3.12-2: | Reporting Levels For Radioactivity Concentrations in Environmental Samples |
| | Table 4.12-1: | Maximum Values for the Lower Limits of Detection |
| | Specification 3.12.1.2: | Land Use Census |
| | Specification 6.5.2.8: | Review |
| | Specification 6.8.1: | Procedures |
| | Specification 6.9.1.4: | Annual and Semiannual Report |

DESCRIPTION OF REQUEST:

Below is a detailed description of each change to the Radiological Effluent Technical Specifications:

Table 3.12-1: Operational Radiological Environmental Monitoring Program

1) Modify the description of the AIRBORNE analysis to require a Gamma Spectral analysis be performed when the sample activity is at least ten times the control sample activity and greater than $1.0_{p}Ci/m^3$.

2) Replace "dose rate" with "gamma exposure rate" in the analysis requirement of the DIRECT RADIATION .

3) Modify the description of the WATERBORNE (Seawater) Tritrium analysis to allow analysis on each sample or on a quarterly composite of monthly samples.

4) Delete the requirements to monitor milk ingestion and applicable footnotes on page 3/4 12-5.

5) Add two more sample locations to the food products monitoring requirements.

6) Modify the monitoring frequency for locations C48a, C48b, and C47 from semi-annual to "monthly (when available)."

7) Add a new footnote to page 3/4 12-5, describing stations C48a and b.

Table 3.12-2: Reporting Levels for Radioactivity Concentrations in Environmental Samples

8) Change the numbers in scientific notation to longhand notation.

9) Revise footnote (b) to specify "assured to be in equilibrium".

10) Add footnote (c) that specifies that the I-131 water sample applies to drinking water only.

Table 4.12-1: Maximum Values for the Lower Limits of Detection

11) Revise numbers in scientific notation to longhand notation.

12) Where two isotopes of a single element are listed together, put each isotope on a separate line.

13) Delete the gross beta LLD for water.

14) Revise the LLD's for Cs-137 as specified on the revised table.

15) Add the following specification to the footnote on page 3/4 12-8:

* The LLD is defined as an a priori (before the fact) limit representing the capability of the measurement system and not as an a posteriori (after the fact) limit for a particular measurement. Analyses shall be performed in such a manner that the stated LLD's will be achieved under routine conditions. Occasionally, background fluctuations, unavoidable small sample sizes, the presence of interferring nuclides, or other uncontrollable circumstances may render these LLD's unachievable. In such cases, the contributing factors shall be identified and described in the Annual Radiological Environmental Operating Report.

16) Revise footnote (c), on page 3/4 12-9 to specify an equilibrium mixture of parent and progeny containing 15 pCi/liter of parent.

17) Add footnote (e), on page 3/4 12-9, specifying that "I-131 ...

Specification 3.12.1.12: Land Use Census

18) Revise Surveillance Requirement 4.12.1.2 to require a land use census "during the growing season" instead of the specific months given previously.

Specification 6.5.2.8: Review

19) Delete the requirements for NGRC review of implementing procedures for the ODCM and the Process Control Program.

20) Delete the requirement to meet the criteria of Regulatory Guide 4.15 from Item (m).

Specification 6.8.1: Procedures

21) Delete requirement to meet the criteria of Regulatory Guide 4.15 from Item (k).

Specification 6.9.1.5: Annual and Semiannual Reports

22) Expand the required content of the Annual Radiological Environmental Operating Report to include a description of unachievable LLD's in the Annual Radiological Environmental Operating Report.

REASON FOR REQUEST:

Below the basis for each change listed above is described:

1) This portion has been revised to be consistent with Florida Power and Light's Radiological Effluent Technical Specifications. Florida Power Corporation and Florida Power and Light employ the State of Florida to perform radiological environmental monitoring. By making each plant's Radiological Effluent Technical Specifications similar, where applicable, there is less probability of confusing the various plants and specifications. Also, consistent requirements relieve the State of Florida from having to have two sets of analysis equipment when one set is really all that is necessary.

2) This revision clarifies the type of analysis.

3) This portion has been revised to be consistent with Florida Power and Light's Radiological Effluent Technical Specifications. See (1) above.

4) The requirement to monitor milk has been deleted because there are usually no milk producing animals within the monitoring area.

5-7) These additional sample locations and requirements have been added in lieu of the milk sample analysis, which has been deleted (see 4).

8) Revising these numbers from scientifc notation to longhand will make all numbers in this specification consistent.

9) Due to equipment and methodology limitations, an accurate determination of parent/progeny concentration is difficult. Therefore, this concentration is assumed to be in equilibrium.

10) The I-131 limit should apply only to drinking water to be consistent with the LLD limits on Table 4.12-1 (footnote b).

11) This change is being requested to make the numerical notation consistent (see 8 above).

12) This change should facilitate reading the requirements associated with two isotopes of one element.

13) Table 3.12-1 does not require a gross beta analysis of water. Therefore, this limit may be deleted.

14) The LLD's that have been changed for Cs-137 are consistent with Florida Power and Light's Radiological Effluent Technical Specifications.

15) This addition clarifies necessary actions to be taken when a sample is unachievable for any variety of reasons; such deviations will be identified in the Annual Radiological Environmental Operating Report.

16) This footnote has been revised due to equipment and methodology limitations (see 9).

17) The LLD's for I-131, Cs-134, and Cs-137 should not apply to single particulate filters due to the low statistical results.

18) This revision will allow greater monitoring flexibility.

19) In general, the NGRC should not be required to review implementing procedures for the ODCM or Process Control Program. Such a review is performed by onsite personnel and committees.

20 and 21) Florida Power Corporation is not committed to using Regulatory Guide 4.15, 1977, although it may be used for guidance.

22) The unachievable LLD's should be described in the Annual Radiological Environmental Operating Report as specified in the footnote on page 12-8 (see 15).

EVALUATION OF REQUEST:

NOTE: The evaluation for this change request as published in the Federal Register is still considered adequate. The following comments summarize impacts that these revisions could have on the published evaluation.

1) This change, although it may be less strict than currently proposed, will not significantly degrade the monitoring program and will enhance the review and evaluation of out-of-specification samples based on the screening provided by the criteria.

2) This change is editorial in nature and thus does not change the monitoring program.

3) See 1 above.

4-7) Florida Power Corporation has found it increasingly difficult to obtain milk samples. Thus we propose to increase the leafy vegtable samples in lieu of the milk samples. This substitution will help ensure a reliable source for monitoring the potential ingested radionuclides.

8) This change is editorial and thus does not change the monitoring program.

9) The State of Florida and University of Florida provide the sampling and monitoring program. Their existing equipment and methodology do not allow for accurate determination of the parent/progeny concentration. The assumption that parent/progeny concentration is an equilibrium mixture is a close approximation to actual concentrations.

10) This change is a clarification in that the I-131 maximum levels indicated in Table 4.12-1 apply only to drinking water and not other water samples.

11) This change is editorial.

12) This change is editorial.

13) This change is editorial. There is no requirement to perform a gross beta analysis of water.

14) See 1 above.

15) This change is consistent with the current required action when an environmental sample is unachievable. (See Specification 3.2 of Appendix B.)

16) See 9 above.

17) When a group of filters are counted together to determine the concentration of I-131, Cs-134, and Cs-137, more counts per unit time are obtained, allowing for a stricter determination of the LLD value.

19) An adequate review of the implementing procedures for the ODCM and Process Control Program can be performed by onsite personnel and committees, thus the NGRC does not need to review these.

20 and 21) Florida Power Corporation may use Regulatory Guide 4.15, 1977, for guidance, but does not consider commitment to this Guide to be necessary to assure an adequate effluent and environmental monitoring program.

22) See 15.

## TABLE 3.12-1

## OPERATIONAL RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

| Exposure Pathway and/or Sample | Number of Samples and Locations | Sampling/ Collection Frequency | Type/Frequency of Analysis |
|---|---|---|---|
| 1. AIRBORNE Radioiodine and particulates | One sample each: CO7, C18, C40, C41, C46, and Control Location C47 | Continuous sampler/ Weekly collection | Radioiodine canister:<br>a) I-131 analysis weekly<br>Particulate sampler:<br>a) Gross $\beta$ at $\geq$ 24 hours/ following weekly filter change.<br>b) Composite gamma spectral analysis (by location)/ quarterly. (Gamma Spectral Analysis shall also be performed on individual samples if gross beta activity of any sample is greater than 1.0 p Ci/$m^3$ and which is also greater than ten times the control sample activity.) |
| 2. DIRECT RADIATION | 1) Site Boundary: C60, C61, C62, C63, C64, C65, C66, C67, C68, C69, C41, C70, C27, C71, C72, C73<br>2) Five Miles: C18, C03, C04, C74, C75, C76, C08, C77, C09, C78, C14G, C01, C79<br>3) Control Location: C47 | Continuous placement/Quarterly collection | Gamma exposure rate/quarterly |

TABLE 3.12-1 (Continued)

OPERATIONAL RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

| Exposure Pathway and/or Sample | Number of Samples and Locations | Sampling/ Collection Frequency | Type/Frequency of Analysis |
|---|---|---|---|
| 3. WATERBORNE<br>Seawater | One sample each:<br>C13, C14H, C14G<br>(All Control Locations) | Grab sample/Monthly | Gamma spectral analysis/monthly<br><br>Tritium analysis on each sample or on a quarterly composite of monthly samples |
| Ground water | One sample:<br>C40 (Control Location) | Grab sample/ semiannual | Gamma spectral and Tritium analysis/each sample |
| Drinking water | One sample each:<br>C07, C10, C18<br>(All Control Locations) | Grab sample/quarterly | Gamma spectral and Tritium analysis/each sample |
| Shoreline sediment | One sample each:<br>C14H, C14M, C14G<br>Control Location<br>C09 | Semiannual sample | Gamma spectral analysis/each sample |
| 4. INGESTION<br>Fish & Invertebrates | One sample each:<br>C29, Control Location<br>C30 | Quarterly:<br>Oysters and carnivorous fish | Gamma spectral analysis on edible portions/each sample |

TABLE 3.12-1 (Continued)

OPERATIONAL RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

| Exposure Pathway and/or Sample | Number of Samples and Locations | Sampling/ Collection Frequency | Type/Frequency of Analysis |
|---|---|---|---|
| Food Products | One sample each: C48a*, C48b*, Control Location C47 | Monthly (when available): Three (3) types of broad leaf vegetation from each location | Gamma spectral and I-131 analysis/each sample |
| | One sample: C19 | Annual during harvest: Citrus | Gamma spectral analysis/ each sample |
| | One sample: C04 | Annual during harvest Watermelon | Gamma spectral analysis/ each sample |

* Stations C48a and C48b are located at or beyond the 4400 ft. site boundary for gaseous effluents in the 2 sectors which yield the highest historical annual average D/Q values.

## TABLE 4.12-1 (Continued)

## TABLE NOTATION

a. The LLD* is the smallest concentration of radioactive material in a sample that will be detected with 95% probability with 5% probability of falsely concluding that a blank observation represents a "real" signal.

For a particular measurement system (which may include radiochemical separation):

$$LLD = \frac{4.66 s_b}{(E)\ (V)\ (2.22)\ (Y)\ (e^{-\lambda \Delta t})}$$

Where:

LLD is the lower limit of detection as defined above (as picocurie per unit mass or volume),

$s_b$ is the standard deviation of the background counting rate or of the counting rate of a blank sample as appropriate (as counts per minute),

E is the counting efficiency (as counts per disintegration),

V is the sample size (in units of mass or volume),

2.22 is the number of disintegrations per minute per picocurie,

Y is the fractional radiochemical yield (when applicable),

$\lambda$ is the radioactive decay constant for the particular radionuclide, and

$\Delta t$ is the elapsed time between sample collection (or end of the sample collection perod) and time of counting (for environmental samples, not plant effluent samples).

Typical values of E, V, Y and $\Delta t$ should be used in the calculation.

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* The LLD is defined as an a priori (before the fact) limit representing the capability of the measurement system and not as an a posteriori (after the fact) limit for a particular measurement. Analyses shall be performed in such a manner that the stated LLD's will be achieved under routine conditions. Occasionally, background fluctuations, unavoidable small sample sizes, the presence of interferring nuclides, or other uncontrollable circumstances may render these LLD's unachievable. In such cases, the contributing factors shall be identified and described in the Annual Radiological Environmental Operating Report.

## RADIOLOGICAL ENVIRONMENTAL MONITORING

### LAND USE CENSUS

### LIMITING CONDITION FOR OPERATION

3.12.1.2 · A land use census shall be conducted and shall identify the location of the nearest milk animal, the nearest residence and the nearest garden* of greater than 500 square feet producing fresh leafy vegetables in each of the land based meteorological sectors within a distance of five miles.

APPLICABILITY: At all times.

ACTION:

a. With a land use census identifying a location(s) that yields a calculated dose or dose commitment greater than the values currently being calculated by Specification 4.11.2.3, identify the new location in the next Annual Radiological Environmental Operating Report pursuant to Specification 6.9.1.5.c.

b. With a land use census identifying a location(s) which yields a calculated dose or dose commitment (via the same exposure pathway) which is at least 20% greater than at a location from which samples are currently being obtained in accordance with Specification 3.12.1.1, this location shall be added to the radiological environmental monitoring program within 30 days. The new sampling location shall replace the present sampling location, which has the lower calculated dose or dose commitment (via the same exposure pathway), after June 30 following this land use census. Identification of the new location and revisions of the appropriate figures from the OFFSITE DOSE CALCULATION MANUAL (ODCM) shall be submitted with the next Semiannual Radioactive Effluent Release Report.

c. The provisions of Specification 3.0.3 and 3.0.4 are not applicable.

d. The reporting requirements of Specification 6.9.1.9.b are not applicable.

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* Broad leaf vegetation sampling may be performed at the site boundary in the direction sector with the highest D/Q in lieu of the garden census.

## 6.7 SAFETY LIMIT VIOLATION

6.7.1 The following actions shall be taken in the event a Safety Limit is violated:

a. The facility shall be placed in at least HOT STANDBY within one hour.

b. The Safety Limit violation shall be reported to the Commission, the Vice President, Nuclear Operations and to the NGRC within 24 hours.

c. A Safety Limit Violation Report shall be prepared. The report shall be reviewed by the PRC. This report shall describe (1) applicable circumstances preceding the violation, (2) effects of the violation upon facility components, systems or structures and (3) corrective action taken to prevent recurrence.

d. The Safety Limit Violation Report shall be submitted to the Commission, the NGRC and the Vice President, Nuclear Operations within 14 days of the violation.

## 6.8 PROCEDURES

6.8.1 Written procedures shall be established, implemented and maintained covering the activities referenced below:

a. The applicable procedures recommended in Appendix "A" of Regulatory Guide 1.33, November, 1972.

b. Refueling operations.

c. Surveillance and test activities of safety related equipment.

d. Security Plan implementation.

e. Emergency Plan implementation.

f. Fire Protection Program implementation.

g. Systems Integrity Program implementation.

h. Iodine Monitoring Program implementation.

i. PROCESS CONTROL PROGRAM implementation.

j. OFF-SITE DOSE CALCULATION MANUAL implementation.

k. Quality Assurance Program for effluent and environmental monitoring.

## ANNUAL AND SEMIANNUAL REPORTS

6.9.1.4 Annual reports covering the activities of the unit as described below for the previous calendar year shall be submitted prior to March 1 of each year. The initial report shall be submitted prior to March 1 of the year following initial criticality.

6.9.1.5 Reports required on an annual basis shall include:

a. A tabulation of the number of station, utility, and other personnel (including contractors) receiving exposures greater than 100 mrem/yr. and their associated man-rem exposure according to work and job functions[1] e.g., reactor operations and surveillance, inservice inspection, routine maintenance, special maintenance (describe maintenance), waste processing, and refueling. The dose assignments to various duty functions may be estimated based on pocket dosimeter, TLD, or film badge measurements. Small exposures totalling less than 20 percent of the individual total dose need not be accounted for. In the aggregate, at least 80 percent of the total whole body dose received from external sources should be assigned to specific major work functions.

b. A list of the reactor vessel material surveillance capsules installed in the reactor at the end of the report period and a summary of any withdrawals or insertions of capsules during the report period. In supplying this information, the ownership of each capsule shall be indicated and the irradiation location in the vessel of each capsule which was inserted during the report period shall be identified.

c. A routine Annual Radiological Environmental Operating Report covering the operation of the unit during the previous calendar year shall be submitted prior to May 1 of each year.

The Annual Radiological Environmental Operating Reports shall include summaries, interpretations, unachievable LLDs, and an analysis of trends of the results of the radiological environmental studies, and previous Annual Radiological Environmental Operating Reports and an assessment of any observed impacts of the plant operation on the environment. If harmful effects or

[1] This tabulation supplements the requirements of 20.407 of 10 CFR Part 20.

ADDITIONAL CHANGE TO
TECHNICAL SPECIFICATION CHANGE REQUEST NO. 36, SUPPLEMENT 2

Figure 5.1-3: Site Boundary for Gaseous and Liquid Effluents

DESCRIPTION OF REQUEST:

23) Include area "4" to the map of the site boundary. Area "4" is the unrestricted area for liquid effluents within the site boundary.

REASON FOR REQUEST:

23) This revision clarifies that the Discharge Canal is an unrestricted area for liquid effluents.

EVALUATION OF REQUEST:

23) This change is editorial.