May 28, 1997

FOR: The Commissioners

FROM: L. Joseph Callan /s/
Executive Director for Operations

SUBJECT: RULEMAKING PLAN:ENERGY COMPENSATION SOURCES FOR WELL LOGGING AND CLARIFICATIONS - CHANGES TO 10 CFR PART 39

PURPOSE:

To inform the Commission that the staff's draft Rulemaking Plan that would modify well logging requirements to reflect the use of new well logging technology has been forwarded to the Agreement States for their comment. Other changes are also being proposed to improve, clarify, and update Part 39.

BACKGROUND:

Part 39 provides the licensing and radiation safety requirements for well logging. The basic regulation was promulgated about 10 years ago when the technology required drilling to stop while parts of the drilling pieces were removed before lowering the logging tool down a well. More recent technology allows well logging to be accomplished during drilling. This technology requires a small radioactive source referred to as an energy compensation source, or ECS. Well logging licensees have identified concerns with the current well logging requirements that were written for the larger-curie sources.

AGREEMENT STATE IMPLEMENTATION ISSUES:

Agreement State licensees should benefit from these changes in a manner similar to NRC licensees. We do not anticipate any Agreement State issues. This rulemaking would be a compatibility level II, that is, the Agreement States must adopt these requirements, but they could be more stringent if they desire.

COORDINATION:

The Office of the General Counsel has no legal objection to the draft Rulemaking Plan. The Office of the Chief Financial Officer has no objection to the resource estimates in the draft Rulemaking Plan. The Office of the Chief Information Officer has reviewed the draft Rulemaking Plan for information technology and information management implications and concurs in it. However, the plan impacts information collection requirements that must be submitted to the Office of Management and Budget for review and approval.

RESOURCES:

Resources to complete the rulemaking are included in the current budget.

L. Joseph Callan
Executive Director for Operations

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Attachment: Draft Rulemaking Plan

**NOTE**: TO BE MADE PUBLICLY AVAILABLE WHEN THE FINAL SRM IS MADE AVAILABLE

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**Draft Rulemaking Plan**

## ENERGY COMPENSATION SOURCES FOR WELL LOGGING AND CLARIFICATIONS - CHANGES TO 10 CFR PART 39

- OGC Analysis.
- Agreement State Implementation Issues.
- Supporting Documents.
- Resources.
- Lead Office Staff and Staff From Supporting Offices.
- Steering Group.
- Enhanced Public Participation.
- EDO or Commission Issuance.
- Schedules.

REGULATORY PROBLEM.
The licensing and radiation safety requirements for well logging are provided in 10 CFR Part 39. The basic regulation was promulgated about 10 years ago. Since then newer technology has been developed that was not envisioned when the rule was written. Portions of the existing regulations are overly burdensome and can be modified with minimal impact to public health and safety. In addition, there are other sections that should be changed to improve, clarify, and update Part 39.

CURRENT REQUIREMENTS AND PROPOSED CHANGES.
The principal objective of the proposed rulemaking is to revise Part 39 to accommodate the small radioactive sources that are now used in some well logging applications. When Part 39 was promulgated, the technology required drilling to stop while parts of the drilling pieces were removed before lowering the logging tool down a well. More recent technology, referred to as "logging while drilling," allows well logging to be accomplished during drilling. This technology requires a small energy compensation source, or ECS. A second innovation separates the ECS and the logging tool from the larger well logging source to allow easier retrieval of the well logging source if the drill stem becomes unretrievable.

The ECS is a small source (less than 0.0001 curie) compared to the normal 3-to-20 curie sources used in well logging. Part 39 has no specific provisions for these small sources because the writers of the existing rule did not envision this technology. Many of the requirements in Part 39, when applied to an ECS, are not necessary to protect public health and safety and the environment and may not be appropriate for an ECS. Because the existing regulations do not allow for variations based on the strength of the radioactive source, licensees who use an ECS must meet all the requirements of Part 39. Examples of unnecessary requirements deal with well abandonment (Sections 39.15 and 39.77), leak testing (Section 39.35), design and performance criteria for sealed sources (Section 39.41), and monitoring of sources lodged in a well (Section 39.69). The NRC staff is proposing that only sections dealing with physical inventory (Section 39.37) and records of material use (Section 39.39) should apply for the use of an ECS.

Therefore, the NRC staff is proposing to modify the regulations in Part 39 to define an ECS and provide appropriate regulations for using ECSs in well logging. The most significant change would exempt an ECS from the costly procedures for well abandonment. Well abandonment, in addition to specific reporting and approval requirements, requires that the source be immobilized and sealed in place with a cement plug, that the cement plug be protected from inadvertent intrusion, and that a permanent plaque be mounted at the surface of the well. Also, the well itself may not be able to be used for its original purpose.

The NRC staff is proposing to limit quantities of licensed material in an ECS to 3.7 MBq [100 microcuries]. This will provide licensees flexibility in the design of ECSs while limiting the source to levels that the Commission has already evaluated for other products and found to be of no significant impact to public health and safety. Current ECSs typically use up to 50 microcuries of Am-241. The NRC has already authorized the distribution of gas and aerosol detectors under Section 32.26 containing more than 100 microcuries of Am-241 to persons exempt from an NRC license.

Several other changes would be proposed to improve, clarify, and update Part 39 requirements.

1. As with the changes being proposed for an ECS, tritium neutron generator target sources should not be required to meet all of the requirements in Part 39. Tritium neutron generator sources typically contain less than 20 curies of tritium which is less hazardous than the typical cesium or americium sources currently being used in well logging applications. The tritium sources only produce a significant neutron stream when a voltage is applied.

For well logging applications, the NRC staff is proposing that the tritium neutron generator targets be subject to the requirements of Part 39 except for the sections dealing with well abandonment (Sections 39.15 and 39.77) and the sealed source design and performance criteria (Section 39.41). As discussed below, the potential hazard of these sources does not warrant the existing requirements for well abandonment in the event that the source becomes lost. In addition, the requirements associated with sealed sources for well logging were not intended for tritium neutron generator target sources, but Part 39 has not been clarified to reflect appropriate requirements for using this type of source in well logging.

The NRC staff is proposing to limit quantities of tritium to 1,110 MBq [30 curies] for tritium neutron generator targets. The current use of tritium neutron generator targets for well logging applications have not exceeded 20 curies. The 30-curie limit would allow licensees flexibility in new designs, while maintaining the tritium within an environmentally safe level. These sources are used for well logging in oil and gas wells. Since a surface casing is used to protect fresh water aquifers, the only potential exposure hazard these sources would present is to the workers. Exposure would only be a problem if the source were ruptured and the tritium were ingested in significant quantities. If a tritium source were lost, it would be contained within thousands of cubic feet of drilling mud. This drilling mud contains hazardous chemicals and is controlled and monitored as part of the drilling operations. Therefore, the NRC staff believes that eliminating costly requirements for these sources will not significantly impact public health and safety.

2. Section 39.77 provides the requirements for notification and procedures for abandoning irretrievable well logging sources. This section specifies that NRC approval must be obtained prior to implementing abandonment procedures. In some circumstances, such as high well pressures that could lead to fires or explosions, the delay required to notify NRC may cause an immediate threat. This section should be modified to allow immediate abandonment, without prior NRC approval, if a delay could cause an immediate threat to public health and safety. The NRC would be notified after the fact.

3. Section 39.15 provides requirements for abandoning irretrievable sealed sources. This section would be modified to provide performance-based criteria for inadvertent intrusion on the source. This would allow licensees greater procedural latitude while continuing to ensure source integrity. The

current requirements may be more restrictive than is necessary for licensees to protect an abandoned source, depending upon the individual well abandonment. For example, if a significant amount of drilling equipment is abandoned with the well, this equipment maybe effective in preventing inadvertent intrusion on the source, but might not meet the requirements of Section 39.15.

Paragraph (a)(5)(ii) of Section 39.15 has prescriptive requirements for irretrievable well logging sources, specifying the use of a mechanical device at a specific location within the abandoned well. The NRC staff is proposing that licensees "prevent inadvertent intrusion on the source," which would require that the source be protected but allow licensees the flexibility to determine the best method. This proposed change would not affect the requirement in (a)(5)(i) for a well logging source to be immobilized with a cement plug or the requirement in (a)(5)(iii) for a permanent plaque.

4. The NRC issued a generic exemption from the current design and performance criteria for sealed sources in 1989. This exemption allows the use of older sealed sources, that have not demonstrated that they meet current criteria, to be used for well logging. This exemption is currently in use, but is not included in Part 39. The regulations would be modified to make this existing procedure an NRC regulation.

Sealed sources that were in use before July 14, 1989, may use design and performance criteria from the United States of America Standards Institute (USASI) N5.10-1968 or the criteria in Section 39.41. The use of the USASI standard is based on an NRC Notice of Generic Exemption issued on July 25, 1989 (54 FR 30883). Sealed sources manufactured after July 14, 1989 had to continue to meet the requirements of Section 39.41. NRC regulations have not incorporated the USASI N5.10-1968 requirements for older sealed sources. The primary difference between the two standards is that the new standard includes a vibration test that was included for consistency with international standards. The USASI standard considered a vibration test and concluded that, to pass the other requirements, the source would be so rugged there was no reason to include a vibration test.

The exemption to allow the use of the USASI standard was to avoid a situation in which well logging licensees might be unnecessarily forced out of business and have to dispose of their sources because the original source manufacturers failed to demonstrate that these sources meet criteria that became effective in 1989. The NRC determined that sealed source models subject to the USASI standard would not adversely affect public health and safety. Because many of these older sealed sources contain radioactive material with half-lives that allow their continued use (i.e., cesium-137 and americium-241 have half-lives of 30 and 458 years respectively), this modification to the regulations is appropriate.

5. Section 39.35 specifies leak testing requirements for sealed sources, and paragraph (e) specifies exemptions from the testing requirements. The existing leak testing requirements should clarify that the requirements apply to the radiation that is capable of escaping the source encapsulation, rather than the radioactive element or material itself. For example, although Am-241 emits both alpha and gamma radiation, when encapsulated in stainless steel (e.g. an ECS source) only the gamma radiation can pass through the capsule.

6. Sections of Part 39 that contain dates that have passed would be updated to reduce confusion. Sections 39.33 and 39.49 contain requirements that were dependent upon dates that have passed and are no longer appropriate. For clarity and to avoid confusion, these sections should be updated to remove requirements that are no longer appropriate.

7. Sections of Part 39 will be updated to conform with the agency's metric policy. Sections 39.15, 39.33, 39.35, and 39.41 contain units of measure that do not comply with the NRC metrication policy. The policy is to state the metric units first, with English units, if desired, in brackets.

ASSESSMENT OF IMPACTS ON LICENSEES AND COST EFFECTIVENESS.

This rulemaking, compared to current requirements, would provide relief to NRC and Agreement State licensees who use an ECS or a tritium neutron generator target for well logging without a significant impact on health and safety. Other revisions to Part 39 would reduce confusion, and may reduce costs, for NRC and Agreement State licensees.

A review of some typical well abandonments has shown that wells have been abandoned with only the ECS present at costs that range from 100's of thousands of dollars to over a million dollars. Since NRC resources to amend 10 CFR Part 39 are estimated to be about one staff year, this is a cost effective one-time use of resources.

OGC ANALYSIS.

The principal objective of the proposed rule is to change the current regulations to reflect the use of new technology that allows logging operations to be done concurrently with drilling. This rule would more appropriately regulate small energy compensation sources. The rule would modify the abandonment procedures for inadvertent intrusion on the source using performance-based criteria, modify the abandonment procedures for tritium neutron generator target sources to avoid costly abandonments since this hazard does not warrant the use of the existing procedures, and modify well abandonment procedures when an immediate threat to public health and safety is involved. The proposed rule would also update sections of 10 CFR Part 39 that contain dates which have passed and implement the metric system. OGC has not identified any Paperwork Reduction Act issues and does not believe this action constitutes a "major rule" pursuant to the Small Business Regulatory Fairness Enforcement Act of 1996. OGC believes that the rule does not constitute a backfit pursuant to 10 CFR 50.109; therefore, a backfit analysis is not necessary. However, OGC believes that the NRC staff must develop an environmental assessment pursuant to 10 CFR 51.21. In all other respects, OGC has not identified any potential legal complications or known bases for a legal objection to the rulemaking.

AGREEMENT STATE IMPLEMENTATION ISSUES.

Agreement State licensees should benefit from these changes in a manner similar to NRC licensees. We do not anticipate any Agreement State issues. This rulemaking would be a compatibility level II, that is, the Agreement States would need to adopt these requirements, but could be more stringent, if they desire.

SUPPORTING DOCUMENTS.

This rulemaking would require a Regulatory Analysis that would estimate the cost savings to both the NRC and licensees for each of the proposed changes. The information provided in the Regulatory Analysis for each change concerning the impact on small entities would be sufficient to support a Regulatory Flexibility Analysis or a certification that the proposed rule would not have a significant economic impact on a substantial number of small entities. No backfit analysis will be needed because the rulemaking would not affect Part 50 licensees. An OMB Clearance Package will be needed because

the rulemaking is expected to reduce reporting or recordkeeping requirements. An Environmental Assessment would be needed to show, as NRC staff currently believe, that there is no significant impact to public health and safety in treating an ECS or a tritium neutron generator target with less stringent regulatory requirements than the larger well logging sources and the other changes discussed.

RESOURCES.
The estimated resources to complete this rulemaking would be about one staff year divided among RES, NMSS, Region IV, and OGC.

Contractor support will be expended to assist in preparing the Environmental Assessment and the Regulatory Analysis. NRC staff estimates this effort at about $60,000.

These resources are included in the current budget.

LEAD OFFICE STAFF AND STAFF FROM SUPPORTING OFFICES.

| | **Lead Office - Project Management** | **Concurring Official** |
|---|---|---|
| | RES - Mark Haisfield | Joseph Murphy |
| | **Technical Support Offices** | |
| | NMSS - Bruce Carrico | Donald Cool |
| | Region IV - Anthony Gaines | Ross Scarano |
| | OGC - Maria Schwartz | Stuart Treby |

STEERING GROUP.
No steering group will be used on this rulemaking. The working group is identified above.

ENHANCED PUBLIC PARTICIPATION.
The Agreement States would be allowed 45 days for input on this draft Rulemaking Plan. This rulemaking will also be available on both the NRC electronic bulletin board at FedWorld and NRC's interactive rulemaking web site to facilitate public dialogue. Both the FedWorld bulletin board and the interactive web site allow users to review comments and questions submitted by others and also provides a mechanism for NRC to respond electronically, where appropriate. The approved Rulemaking Plan and the proposed rule will be placed on FedWorld.

EDO OR COMMISSION ISSUANCE.
It is recommended that the EDO issue the proposed and final rule. This action does not constitute a significant question of policy, and falls within the EDO's authority. If significant policy issues are raised during the public comment period, a SECY Paper will be prepared for the final rule.

SCHEDULES.

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| Draft Rulemaking Plan for Office concurrence (allow 20 days for Office review) | March 1997 |
| Draft Rulemaking Plan to the Agreement States and CRCPD for comment, and SECY Paper to the Commission for information | June 1997 |
| SECY Paper, including draft Rulemaking Plan, with disposition of Agreement State comments for Office concurrence (allow 20 days) | September 1997 |
| SECY Paper, for approval of Rulemaking Plan, to EDO | October 1997 |
| Approval of final Rulemaking Plan to initiate rulemaking and publish final Rulemaking Plan on Bulletin Board | December 1997 |
| Proposed rulemaking package for Office concurrence | June 1998 |
| Proposed rulemaking package to the EDO | August 1998 |
| Proposed rule published (60 day comment period) and submittal of OMB Clearance Package to OMB | October 1998 |
| Final rule published | July 1999 |