July 1, 1999

FOR: The Commissioners

FROM: William D. Travers /s/
Executive Director for Operations

SUBJECT: TREATMENT OF AVERTED ONSITE COSTS IN REGULATORY ANALYSES

PURPOSE:

To respond to a portion of issue IV.K of the Chairman's Tasking Memo, which directs the staff to address the Nuclear Energy Institute's (NEI 's) concern with the inclusion of averted onsite costs (AOSC) in the cost-benefit section of NRC regulatory analyses.

SUMMARY:

This paper evaluates NRC's regulatory analysis methodology with respect to the treatment of averted onsite costs. The present methodology includes consideration of AOSC. The NRC's policy concerning this issue is in "Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission" (Guidelines).(1) This paper considers an option that would delete AOSC from the methodology and recommends against its adoption.

BACKGROUND:

CURRENT POLICY

A regulatory analysis includes an assessment of the societal consequences (favorable and unfavorable effects) of a proposed governmental action. At NRC, such an action might involve the consideration of a new regulatory requirement that enhances safety by reducing the probability of an accident. In broad terms, the favorable effects of such a safety initiative are first, the potential for reduced exposure to radiation, which is measurable in terms of the dollar value of averted person-rem; second, the potential for reduced damage to or loss of offsite property, which is characterized as averted offsite property costs; and third, the potential for reduced damage to or loss of onsite property, which is referred to as AOSC.

AOSC are meant to capture accident-related consequences that are typically borne directly by the licensee, such as the cost of replacement energy and power; plant cleanup, decontamination, and repairs; early decommissioning; and other potential financial consequences that are primarily a direct financial responsibility of the licensee.

The Guidelines identify AOSC as a relevant attribute to be included in the cost-benefit analysis. However, when the exclusion of AOSC would be expected to result in a different cost-benefit conclusion, the Guidelines direct the staff to display the results with this attribute excluded. In this way, the decision maker is made aware of the sensitivity of the results to this attribute and can factor this into any subsequent regulatory decision.

Since this treatment of AOSC was deemed controversial, the issue was raised with the Advisory Committee on Reactor Safeguards (ACRS), Committee to Review Generic Requirements (CRGR), and the Commission when they reviewed the revised Guidelines. In the staff's view, all parties agreed with the current AOSC policy. For example, the Commission directed the staff to include AOSC in regulatory analyses and indicated a preference for the staff to also display the results without AOSC if such exclusion would change the apparent conclusion to be drawn from the calculated net benefit or value/impact ratio.(2)

RATIONALE FOR CURRENT POLICY

The underlying rationale for including AOSC in cost-benefit analyses is rather straightforward and lies at the very essence of a cost-benefit analysis. Cost-benefit analyses are designed to consider ALL societal effects so that the analysis presents a complete picture of the potential consequences of the proposed action and the ultimate decision is consistent with the efficient allocation of resources from the point of view of society as a whole. These primary objectives cannot be satisfied if the analysis selectively omits direct consequences.

AOSC constitute economic benefits that typically accrue to the same parties who bear the cost of a regulation, and as such, are frequently referred to as private or internalized benefits. Although the treatment of AOSC in NRC cost-benefit analyses has been controversial, the inclusion of private or internalized benefits in cost-benefit analyses prepared by other federal agencies is standard practice. This was confirmed in discussions with the Office of Management and Budget (OMB), the Federal agency directly involved in drafting regulatory impact analysis guidance and charged with evaluating government-wide adherence to Executive Order 12866 (Economic Analysis of Federal Regulations). In their view, the inclusion of private or internalized benefits "... is standard practice in the profession and usually goes without saying."(3)

In addition, the staff contacted the Regulatory Analysis Division of the Federal Aviation Administration (FAA EXIT) because they deal with issues similar to AOSC. FAA regulatory initiatives focus on improving passenger safety, just as NRC regulations focus on health and safety. However, FAA safety regulations are also likely to reduce the probability that airplanes will be lost or damaged, a situation that is highly analogous to an NRC regulatory initiative that, in addition to improving public health and safety, can also reduce the probability that nuclear power plants may be lost or damaged. Based on discussions with the FAA and a review of their guidance document on making regulatory decisions,(4) it is evident that the inclusion of the

benefit of averting airplane losses is a standard, non-controversial, and important consideration in FAA's cost-benefit analyses.

Nevertheless, the staff acknowledges that the treatment of AOSC in NRC analyses continues to be viewed as controversial by licensees and within the NRC. Over the years, numerous arguments have been put forth by industry that challenge the appropriateness of including AOSC in NRC's cost-benefit analyses. Those issues and concerns are reviewed in the "Discussion" section of this information paper. A review, which traces the historical evolution of the issue within the NRC, is included as Attachment 1 to this paper.

DISCUSSION:

CONCERNS REGARDING CURRENT POLICY

Industry's overriding concern is that, by including AOSC in NRC's cost-benefit analyses, the NRC would be in a position to impose regulations that go beyond protecting the public health and safety. In support of this position, industry raises the following arguments as justification for excluding AOSC.[5] AOSC constitute benefits that accrue solely to the licensee and should not be under the purview of the health and safety regulator. They divert the NRC from its primary responsibility of assuring protection of the public health and safety and would involve the NRC in the internal management of nuclear power plants, a role for which it has no responsibility or statutory authority. Including AOSC would unnecessarily impede licensees from carrying out their primary responsibility, which is the safe, reliable, and economic generation of nuclear power. Finally, even if AOSC were an appropriate societal cost-benefit consideration, it is already covered by insurance and therefore its inclusion would constitute double-counting.

Putting aside industry's specific arguments, it appears worthwhile to first examine the underlying premise that AOSC allow the agency to impose regulations that go beyond protecting the public health and safety.

The NRC has a very formal and disciplined process in place to control its imposition of new requirements. Basically, in order for the NRC to impose a new generic requirement, the backfit rule must be satisfied (unless adequate protection is involved). The first step in that process is to determine whether a substantial increase in the overall protection of the public health and safety or common defense and security would occur. No consequences, costs and benefits of any kind, are included in this determination. A substantial improvement in safety is defined in the Safety Goal Evaluation, and it is solely a function of the change in core damage frequency per reactor year and the conditional containment failure probability. The Safety Goal Evaluation is also an integral part of the Guidelines and the NRC's regulatory analysis process. Only if the safety enhancement meets the safety goal threshold is the initiative subject to a cost-benefit evaluation, but that initiative must have demonstrated a substantial increase in protection. The cost-benefit analysis satisfies the second criteria of the backfit rule by determining whether the regulatory initiative is cost-justified. Therefore, the view that AOSC allows the NRC to impose regulations that do not protect the public does not appear well founded.

AOSC ARE A PRIVATE BENEFIT

Several of industry's specific arguments relate to their view that AOSC constitute benefits that accrue solely to the licensee and, therefore, the NRC is involving itself in internal licensee investment and operational decisions that are beyond the Commission's purview.

As noted in the evaluation report,[6] the TMI experience demonstrated that the financial onsite costs are not borne exclusively by the licensee. A substantial fraction of the cleanup costs came from the public, either via customer revenues or State and Federal government contributions. Further, the loss of a reactor can result in decreased electric utility system reliability, higher customer rates, and replacement power supplied by coal-fired plants with negative impacts on the environment and public health. These impacts are typically the most dominant component of AOSC and are not borne by the utility, but rather by the customers and the general public. Thus, to suggest that AOSC are solely a licensee benefit, with no broader societal implications, is an over-simplification.

It also seems inconsistent for industry to challenge the inclusion of financial benefits to utilities, while fully accepting the inclusion of the utility's financial costs in the very same analysis. For example, industry accepts including replacement energy (during the downtime to implement a modification) as a cost, while at the same time, it criticizes the inclusion of avoidance of downtime (which would be caused by an accident) as a benefit. Both would tend to involve NRC in the internal business affairs of utilities.

AOSC ARE NOT A PUBLIC HEALTH AND SAFETY ISSUE

A second concern is that because AOSC are not a public health and safety issue, regulations justified by considering AOSC would deflect both the NRC and the industry away from their primary responsibilities.

For the NRC to consider AOSC for a given regulatory initiative, the NRC must first conclude that the regulatory proposal does provide a substantial increase in the overall protection of public health and safety. Thus, whenever a cost-benefit analysis, and consideration of AOSC, are under review, attention is being focused on proposals that have safety significance. It is true, however, that for any given safety significant issue, AOSC have the potential to tilt the outcome in favor of approval based on a more favorable comparison of benefits and costs. This is not an inappropriate outcome from a public safety perspective. By including a full and accurate accounting of the real net cost of the action, the public is not deprived of additional safety because "utility savings" were not contained in the cost-benefit analysis.

Ultimately, the NRC is deciding whether to commit societal resources, and that decision must be weighed against the values that accrue to all segments of society. It is only through a complete accounting of all consequences that society's scarce resources are directed to achieve the greatest net benefit. This point can perhaps best be illustrated with an example.

Consider two regulatory proposals. The first is a mitigative fix that is capable only of reducing the consequences of an accident, and the second is a preventive fix and is capable of reducing the probability of an accident. The benefits attributable to the first initiative are reductions in person-rem and offsite property damage. AOSC are not affected because the probability that the reactor will be damaged is the same regardless of whether the initiative is implemented or not. The second initiative is a preventive fix, and as such reduces the probability of an accident. The benefits attributable to it include reductions in person-rem, offsite property damage, and AOSC. Assume each initiative provided a substantial increase in protection and had the exact same costs and benefits, exclusive of AOSC. Which initiative should be given priority? If AOSC are omitted from NRC cost-benefit analyses, these results would suggest indifference between the two. Further, if the net benefit results were only slightly altered between the two initiatives, one could envision a set of calculations that favored the mitigative fix and rejected the preventive fix. If a regulatory proposal were not adopted because of a failure to consider AOSC and an accident that could have been averted was not, society would incur billions of dollars of onsite costs. These dollars represent resources that could have been expended elsewhere, likely, in part, contributing to the public health and safety in other ways.

In addition, the underlying premise that AOSC are not a public safety issue is not entirely accurate. As noted above, replacement power is an integral component of AOSC, and to the extent it relies on coal, there will be incremental health and safety consequences from the mining, transportation, and burning of this form of energy.

AOSC ARE ALREADY COVERED BY INSURANCE

The final industry argument is related to insurance for onsite property damage. Industry has maintained that, because the damage has already been covered by insurance, the inclusion of AOSC in the cost-benefit analysis would constitute double-counting.

The fact that the licensee has insurance for onsite damage is irrelevant. From a societal perspective, insurance represents a redistribution of resources with no real loss to society. Insurance premiums, like taxes, are a transfer payment between different segments of society and constitute no real consumptive use of resources. In effect, the insurance has no application in the cost-benefit analysis (the only exception being relatively minor transaction costs and costs of managing and administering the insurance funds). Rather, the relevant measure for the cost-benefit analysis is the societal burden that results from an accident. These views are fully consistent with OMB guidance.(7)

POLICY OPTIONS:

The only option identified as an alternative to the current policy is to disallow consideration of AOSC in NRC regulatory analyses. The sole advantage to disallowing consideration of AOSC is that it resolves all of industry's concerns. The disadvantages are that it runs counter to the continuation of a policy that has a sound rationale and is rooted in cost-benefit theory, and is at odds with OMB guidance and the treatment of analogous attributes by other Federal agencies.

COORDINATION:

The Office of the Chief Financial Officer has reviewed this paper for resource implications and has no objections. The Office of the Chief Information Officer has reviewed this paper for information technology and information management implications and concurs in it. The Office of the General Counsel has no legal objection to this paper. The ACRS reviewed this paper and in a letter of June 11, 1999, expressed agreement with the staff's position. In addition, the CRGR was briefed and indicated it had no objection to the approach taken by the staff.

CONCLUSION:

As a result of this review, the staff recommends no change to the NRC's treatment of AOSC is necessary. The staff requests action within 10 days. Action will not be taken until the SRM is received. We consider this action to be within the delegated authority of the EDO.

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Attachment: As stated

ATTACHMENT

HISTORICAL PERSPECTIVE OF AVERTED ONSITE COSTS

Averted onsite costs (AOSC) were first raised by the ACRS in commenting on the Commission's proposed safety goals. In its 1982 safety goal deliberations, the Commission considered whether averted reactor damage should be counted as a benefit. In June 1982, the ACRS stated:

> Economic loss due to plant damage and to contamination outside the plant would be as real a loss to society as direct health effects.(8)

And in September 1982, the ACRS wrote:

> We believe it is important to include avoidance of economic losses (on and offsite) as a benefit in the application of benefit-cost criterion

> together with an appropriate benefit for the avoidance of health effects. Society would have to bear directly any offsite costs. In addition, onsite costs are likely to be passed along in whole or in part, through insurance or other costs which would be reflected in electricity rates.[9]

At the same time, industry strongly opposed any inclusion of AOSC because they believed that the NRC should restrict itself to public health and safety matters and not take into consideration the financial investment of the utility. The Commission agreed with the utilities and decided not to include onsite property damage factors.

In a subsequent evaluation of the safety goals, the Commission instructed the staff to develop any revisions that were shown to be necessary as a result of the two year evaluation period. The staff issued a report that concluded:

> The most significant change being proposed by the Steering Group is that, for core melt accidents, the averted onsite radiological costs, including economic costs, should be considered as a benefit in the benefit-cost guidelines.[10]

In 1987, Commissioner Bernthal requested the views of the Office of the General Counsel (OGC) on whether excluding AOSC in backfit analyses is legally defensible. In OGC's response, they could find no defensible basis for excluding AOSC in cost-benefit analyses. However, OGC proposed that AOSC be treated as a cost offset, rather than a benefit, given the agency's mission to protect the public health, safety, and property.[11]

In 1990, the Commission supported the use of AOSC as an offset against other licensee costs (and not as a benefit) in cost-benefit analyses.[12] This constituted a full endorsement of the OGC position as expressed in 1987.

Industry has continued to disagree with the NRC on this issue. Most notably, in 1989, an arm of the Electric Power Research Institute issued a report that questioned a number of NRC's cost-benefit techniques.[13] One issue that appeared to have some merit concerned the treatment of AOSC as a cost offset.

In the revised Guidelines[14] the NRC effectively addressed this concern. The current policy is that all cost-benefit results are to be displayed on a net benefit basis. This effectively leaves moot the question of whether AOSC appears in the denominator or numerator and constitutes a complete commingling of costs and benefits. This has been adopted because OMB's regulatory analysis guidance views net benefits as the preferred and recommended display of results. In addition, its use effectively eliminates the inconsistencies noted by industry in the ratio formulation. The Guidelines still permit an analyst to display ratio results recognizing that they also provide an important perspective to the decision maker. In these instances, AOSC are treated as a cost offset in deference to OGC's legal interpretation.

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1. NUREG/BR-0058, Revision 2, "Regulatory Analysis Guidelines of U.S. Nuclear Regulatory Commission," November 1995.

2. SRM to the EDO on SECY-95-028, "Issuance of Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission," June 30, 1995.

3. E-Mail from Richard Theroux, Office of Information and Regulatory Affairs, OMB, March 29, 1999.

4. U. S. Department of Transportation, Federal Aviation Administration, FAA-APO-98-4, "Economic Analysis of Investment and Regulatory Decisions-Revised Guide," January 1998.

Conversation with Paul Larson, Manager, Regulatory Analysis Division, Office of Policy and Evaluation, FAA, April 5, 1999.

5. Most recently in a letter from the Nuclear Energy Institute, August 11, 1998.

6. U.S. NRC, Safety Goal Evaluation Steering Group, "Safety Goal Evaluation Report," April 18, 1985.

7. OMB, "Economic Analysis of Federal Regulations Under Executive Order 12866," January 1996.

8. ACRS letter from P. Shewmon to N. Palladino, "Comments on Proposed Policy Statement on Safety Goals for Nuclear Power Plants," June 9, 1982.

9. ACRS letter from P. Shewmon to N. Palladino, "ACRS Comments on the NRC Staff Questions to the Commission Concerning the Policy Statement on Safety Goals for Nuclear Power Plants," September 15, 1982.

10. U.S. Nuclear Regulatory Commission, Safety Goal Evaluation Steering Group, "Safety Goal Evaluation Report," April 18, 1985.

11. Letter from W. Parler to Commissioner Bernthal, May 1987.

12. Staff Requirements Memorandum to the EDO on SECY-89-102, "Implementation of the Safety Goals," June 15, 1990.

13. Nuclear Safety Analysis Center, "Questionable Techniques Used in Cost-Benefit Analyses of Nuclear Safety Enhancements." NSA/143, November 1989.

14. U.S. Nuclear Regulatory Commission, "Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission, Final Report," NUREG/BR-0058, November 1995.