

OFFICE OF THE SECRETARY
CORRESPONDENCE CONTROL TICKET

Date Printed: Feb 13, 2007 08:24

PAPER NUMBER: LTR-07-0112

LOGGING DATE: 02/13/2007

ACTION OFFICE: EDO

To: Dyer, NRR

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cys: EDO
DEDMRS
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SUBJECT: SECY-06-0244, Final Rulemaking - 10 CFR PT 26 - Fitness-for-Duty Programs - Backfit Analysis

ACTION: Appropriate

DISTRIBUTION: RF, RAS

LETTER DATE: 02/12/2007

ACKNOWLEDGED No

SPECIAL HANDLING:

NOTES:

FILE LOCATION: ADAMS

DATE DUE:

DATE SIGNED:

Template: SECY-017

E-RIDS: SECY-01



NUCLEAR ENERGY INSTITUTE

Marvin S. Fertel
SENIOR VICE PRESIDENT AND
CHIEF NUCLEAR OFFICER

February 12, 2007

The Honorable Dale E. Klein
Chairman
U.S. Nuclear Regulatory Commission
Mail Stop O 16 C1
Washington, DC 20555

Subject: SECY-06-0244, "Final Rulemaking - 10 CFR Part 26 – Fitness-for-Duty Programs," Backfit Analysis

Project Number: 689

Dear Chairman Klein:

On December 21, 2006, the Nuclear Energy Institute¹ (NEI) submitted a letter to the Commission providing industry's perspective on the October 2006 draft final rule amending NRC fitness-for-duty (FFD) regulations in 10 CFR Part 26. Subsequently, the NRC released SECY-06-0244, "Final Rulemaking - 10 CFR Part 26 – Fitness-for-Duty Programs," which provided the industry its first opportunity to review the Staff's backfit analysis for the FFD final rule. This letter addresses the Staff's backfit analysis. Based upon our review of this analysis, the amended 10 CFR Part 26, Subpart I fails to satisfy 10 CFR 50.109.

NRC Regulation, 10 CFR Section 50.109 provides that (with certain exceptions not relevant here) the NRC will require backfitting only when it determines, based on a reasoned analysis, that the backfit will substantially increase the overall protection of the public health and safety or the common defense and security, and that the direct and indirect costs of its implementation are justified by this increased protection. Contrary to these requirements, the backfitting analysis in SECY-06-0244 fails to support a Commission conclusion that the proposed new "days-off" requirements in Subpart I are integral to achieving the purpose of the rule, that those requirements will increase the overall

¹ NEI is the organization responsible for establishing unified industry policy on matters affecting the nuclear energy industry. NEI's members include all entities licensed to operate commercial nuclear power plants in the United States, nuclear plant designers, major architect/engineering firms, fuel fabrication facilities, nuclear material licensees, and other organizations and individuals involved in the nuclear energy industry.

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protection to the health and safety of the public, or that the significant costs to implement these new requirements are justified.

The Staff's backfit analysis asserts but fails to show that promulgating the "days-off" requirements in Subpart I will ever achieve its desired result – reducing the *potential* for worker fatigue – let alone showing that the increased costs are justified. That is, the Staff does not demonstrate that worker fatigue in the nuclear industry is causing a significant number of errors. Further, the Staff presents no viable basis for concluding that any fatigue-related human performance errors occurring in the industry are occurring in such numbers and present a safety risk of such magnitude that preventing the mere potential for fatigue will result in a *substantial* increase in the protection of the public health and safety. Moreover, as noted in NEI's December 21 letter, the proposed fatigue management provisions other than those in Subpart I of the final draft rule are sufficient to reduce the potential for acute and chronic fatigue in industry workers. Thus, the Subpart I "days-off" requirements, if promulgated, will yield little if any increased benefit but will add significant cost.

The Staff estimates the present value of the costs associated with fatigue management as between \$572,863,000 for a 7 percent discount rate and \$898,127,000 for a 3 percent discount rate, and attributes over 40 percent of this sizeable amount solely to implementing the Subpart I "days-off" requirements. Without a reasoned analysis showing that these significant costs are justified by a substantial increase in protection of public health and safety, the backfit rule prohibits promulgation of the new "days-off" provisions.

The backfitting analysis also is deficient because it does not address the fact that NRC licensees cannot readily add the workers needed for nuclear plants to meet the new "days-off" requirements. Nor does the analysis recognize that these new workers will not be available at current prevailing rates. In actuality, shortages of personnel with key skills currently exist and some nuclear plants already are unable to meet their recruiting objectives for outage personnel. The FFD rule's overtime restrictions, if implemented, will further reduce the pool of available candidates. New plant construction will create even more demand for many of the same required skills. The tight labor market, in turn, will trigger both increased labor costs and longer plant outages. The Staff's analysis inexplicably ignores the effect that outage extensions will have on the overall cost of implementing the new "days-off" requirements. This cost, particularly the cost of replacement power, must be considered in addition to the incremental increase in labor costs that the Staff projects.

For these and other reasons described in more detail in the Enclosure to this letter, we believe that the backfit analysis in SECY-06-0244 fails to satisfy the NRC backfitting rule with regard to Part 26 Subpart I proposed "days-off" requirements. Accordingly, NEI requests that the Commission delete those requirements in proposed Section 26.205(d)(3)-(7) from the draft final rule.

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We appreciate this opportunity to express these concerns on this important issue. If you have any questions regarding this letter or the enclosure, please contact me at 202-739-8125.

Sincerely,



Marvin S. Fertel

Enclosure

c: The Honorable Edward McGaffigan Jr., Commissioner, NRC
The Honorable Jeffrey S. Merrifield, Commissioner, NRC
The Honorable Gregory B. Jaczko., Commissioner, NRC
The Honorable Peter B. Lyons, Commissioner, NRC
Mr. Luis A. Reyes, Executive Director for Operations, NRC

**The Staff's Backfitting Analysis in SECY-06-0244 Fails to Justify Promulgation of
10 CFR Part 26, Subpart I "Days-off" Requirements**

Pursuant to the backfit rule, the Commission shall order the backfitting of a facility only when it determines that the backfit provides a substantial increase in the overall protection of public health and safety or the common defense and security, and that the direct and indirect costs of the action are justified in light of this increased protection. 10 CFR 50.109(a)(3). The NRC has the burden to demonstrate both parts of this requirement: a mere assertion of these findings is not sufficient.

To meet the requirements of the backfit rule, the fatigue management requirements in 10 CFR Part 26, Subpart I must increase substantially protection of public health and safety. To demonstrate this, the NRC Staff must first establish that there are a substantial number of fatigue-induced errors across the industry. Further, the Staff must provide a basis for concluding that the industry's current safeguards against fatigue-induced human performance errors (e.g., work-hour controls, behavior observation programs and systems for work control and quality assurance) are ineffective. The Staff's backfitting analysis in SECY-06-0244, "Final Rulemaking-10 CFR Part 26 – Fitness-for-Duty Programs," does neither.

The Staff's backfitting analysis in SECY-06-0244 fails to justify imposition of the "days-off" requirements for normal operation and outages that are imposed by proposed Section 26.205(d)(3)-(7) in Subpart I of amended 10 CFR Part 26. Accordingly, the Nuclear Energy Institute (NEI) requests that the Commission reject the Staff's request to approve the Part 26 final draft rule without modification, and direct the Staff to remove the "days-off" requirements in proposed Section 26.205(d)(3)-(7) from the final rule.

The Backfit Analysis in SECY-06-244 Is Deficient because It Is an Aggregated Analysis

The backfit analysis can either address the impacts of the proposed backfit in the aggregate or consider portions of the proposed backfit individually. The Staff improperly performed an aggregated backfit analysis for the Part 26 final rule. The Commission has directed that the Staff assess each proposed change and determine whether it “imposes costs disproportionate to the safety benefit attributable to that change.” See Oct. 3, 2001 Memorandum from Annette L. Vietti-Cook to William D. Travers. In such cases, aggregation would not be appropriate unless “the individual change is integral to achieving the purpose of the rule, has costs that are justified in view of the benefits that would be provided, or qualifies for one of the exceptions in 10 CFR 50.109(a)(4).” *Id.* The Commission’s guidance has not been followed in this case and the result is that the Commission may promulgate a portion of the FFD rule that clearly fails to comply with the agency’s backfit requirements.

In its aggregated backfit analysis of the Part 26 final rule, the Staff calculated the annual cost for an average licensee fitness-for-duty (FFD) program to be \$1,486,100 with a one-time cost of \$481,700. SECY-06-244, Encl. 4 (Reg. Analy.) at 65. The agency concluded that almost all of the costs associated with the draft final rule -- \$1,475,314 of the \$1,486,100 annual cost -- are attributable solely to the proposed fatigue management provisions in Section I. Of these costs, 41 percent (approximately \$605,550) can be attributed to the rule’s “days-off” requirements, which are the focus of NEI’s concern.

The Staff concludes that the backfits in the draft final rule “when considered in the aggregate, constitute a substantial increase in the protection to public health and security” Reg. Analy. at 68. The Staff claims this to be the case because the draft final rule addresses seven “key areas” that “pose recurring and, in some cases, significant problems with respect to the effectiveness, integrity, and efficiency of fitness-for-duty programs at nuclear facilities.” *Id.*

Although the industry supports almost all of the provisions of the Part 26 draft final rule, we have identified significant concerns relating to the Staff's analysis of the first of these seven areas, worker fatigue, as that issue is addressed in proposed Subpart I's required "days-off" provisions.

The Backfit Analysis in SECY-06-244 Is Deficient because the Staff Should Not Have Used a Qualitative Analysis

The Staff's determination that the draft final rule as a whole constitutes a substantial increase in the protection of public health and safety is based on a *qualitative* rather than quantitative analysis. Reg. Analy. at 16, 65. The Staff's reliance on a qualitative analysis in this instance ignores the Commission's clear guidance and constitutes a fundamental flaw in this backfit analysis. The Commission has emphasized that reliance on a qualitative assessment of benefits should be used only as "a last resort," and that, if used, a qualitative analysis will be subject to a much higher level of scrutiny:

The analyst is cautioned that this type of regulatory analysis is subject to a higher level of scrutiny by the decisionmaker because of the degree of judgment involved. Reliance on the qualitative approach should be a last resort, to be used only after efforts to develop pertinent data or factual information have proven unsuccessful.¹

The Staff decided to forego a quantitative assessment of the safety benefits of the fatigue management provisions in proposed Subpart I because it concluded that such an evaluation would be difficult. Reg. Analy. at 16. Indeed, the Staff asserts that it *cannot* quantify how the rule will reduce the risk to the public from offsite releases of radioactive materials as a result of cognitive impairment from fatigue. *Id.* at 66.

Given the substantial and disproportionate costs associated with Part 26 Subpart I and the Commission's position discouraging reliance on qualitative regulatory analyses, the Commission should require the Staff to quantify the safety benefits that purportedly result from Subpart I that

¹ NUREG/BR-0058, Rev. 4, *Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission* (Oct. 2004) at 30.

supposedly justify the costs of implementing the fatigue management provisions. In our view, the Staff can and should be required to analyze and quantify the vast amount of nuclear industry human performance data available and determine whether nuclear industry worker fatigue is, in fact, causing a significant number of errors and whether the errors are safety significant. Only then can the Staff determine whether preventing fatigue will provide a safety benefit that will result in a *substantial* increase in the protection of the public health and safety.

The Staff's Qualitative Analysis Does Not Demonstrate That Worker Fatigue Is an Actual Problem in the Nuclear Reactor Industry

The backfit analysis asserts that the draft final rule's fatigue management provisions will "reduc[e] the risk of accidents, fires, property damage, and/or security events due to the effects of worker fatigue." Reg. Analy. at 37. The qualitative analysis does not provide a sufficient basis for concluding that an actual problem with worker fatigue exists in the nuclear energy industry, or that fatigue in the industry has created a safety hazard.

The Staff's analysis (see Reg. Analy. at 68 (emphasis added)) sets forth five assertions that supposedly show a high *potential* for fatigue among nuclear workers:

1. Work hour controls implemented by power reactor licensees vary due to differing interpretations of NRC guidance.
2. "Some licensees" authorize deviations from these controls resulting in substantial overtime for workers.
3. Licensees' use of 12-hour shifts, including 6 or more consecutive 12-hours shifts during outages, is "very common."
4. There have been examples of nuclear workers falling asleep while on the job.
5. Security officers at "certain licensees" have alleged their employers required them to work excessive amounts of overtime.

The industry does not dispute that these statements have some factual underpinning. But, even if true, neither these assertions, nor the qualitative and anecdotal information the Staff provides in support, demonstrate an actual problem with worker fatigue, or that fatigue is causing safety-related human performance errors that, if prevented, will provide a *substantial* increase in the protection of the public health and safety.

The differences in licensee interpretation of existing NRC license provisions concerning work hours highlight the limited usefulness of the Staff's qualitative analysis. The Staff states that "licensees have inconsistently interpreted the scope of personnel who must be subject to the technical specification work hour limits." Reg. Analy. at 41. However, inconsistent interpretations of NRC guidance do not, in isolation, provide a basis to conclude that nuclear workers are fatigued. Rather, it indicates a need to revise and clarify the agency's guidance.

The Staff's statement in the backfit analysis regarding deviations or waivers for overtime also is unpersuasive. The overuse of waivers by a few licensees does not demonstrate a high potential for fatigue throughout the nuclear industry, or justify the substantial costs associated with universally imposed added work hour controls. A more appropriate and cost-effective way to address this problem is to focus inspection resources on this issue and, if circumstances compel, use enforcement authority. In any event, the over-use of deviations has been fully addressed by proposed Section 26.207 (waivers and exceptions) of the final rule, which substantially limits licensees' ability to waive work hour limits. Work hour and "days-off" requirements are not needed to address this concern.

The Staff's qualitative assessment of the industry's use of 12-hour shifts similarly does not provide evidence of significant fatigue problems at nuclear plants. The Staff has been aware of these work scheduling practices and has had ample opportunity to assess their effect on human performance. The Staff has not provided any data to demonstrate that the use of these schedules in the industry has produced a fatigue problem, or that human performance errors attributable to

fatigue have increased. As the Staff acknowledges, 12-hour shifts generally are used for plant refueling outages. Although the analysis recognizes that the average industry outage lasts 39 days, it does not take into account the fact that most outage workers are contractors who work only during portions of an outage. SECY 06-244, Encl. 3 at 598, Reg. Analy. at 68.

Finally, the Staff's analysis does not claim and cannot show that the few instances of an operator or security officer falling asleep while on duty represent a widespread problem. Nor does it show that these incidents arose from excessive work schedules or resulted in potentially safety-significant human performance errors. Similarly, the fact that a group of security officers claimed certain licensees required them to work what they considered to be excessive overtime fails to show the existence of a general fatigue problem. Thus, there was no suggestion that the licensees in these cases had ignored or misinterpreted the NRC guidance. Further, the Staff's mention of the guards' concerns is not accompanied by any indication that the Staff believes that the overtime caused fatigue-induced human performance errors.

In addition to these anecdotes, the Staff cites as support for the "days-off" requirements additional subjective data such as the 2000 Sleep-in America Poll. That poll analyzed the relative frequency of individuals reporting "waking up unrefreshed" depending on their work-hours per week. SECY-06-244, Encl. 3 (draft Federal Register Notice) at 56. Such anecdotal, subjective, or isolated examples do not reveal an actual fatigue problem in the nuclear industry, and therefore cannot create a basis for concluding that fatigue in the industry is producing a safety issue. The broad inferences that the Staff draws based on this information illustrates why the Commission subjects qualitative regulatory assessments to a high level of scrutiny, and why qualitative assessments should be used "only after efforts to develop pertinent data or factual information have proven unsuccessful." NUREG/BR-0058, Rev. 4, at 30.

Indeed, the Staff's failure to provide any type of quantitative analysis is surprising, given the information available. Importantly, an assessment previously cited by the Staff showed "there are

only a limited number of events at U.S. nuclear power plants that have been attributed to fatigue.” SECY-01-0113, “Rulemaking Plan: Fatigue of Workers at Nuclear Power Plants” at 3. NEI identified this assessment in its December 21, 2006 comment letter on the “draft final rule” language. In that December 2006 letter, NEI also discussed a 2005 assessment it conducted using actual nuclear power plant human performance data obtained from operating commercial nuclear facilities, to determine whether such real-world data supports the Staff’s claims. In particular, the program assessed the Staff’s assertions that individuals who work more than six days are causing fatigue-induced errors and that human performance errors increased during an extended outage. The industry previously shared the results of this assessment with the NRC in a December 20, 2005 comment letter on the Part 26 proposed amendments, and in response to the Staff’s request, industry provided the study’s underlying data in a 48 page letter to Michael Case dated February 3, 2006.

The industry assessment was comprised of two parts. The first cross-referenced human performance event data with the day of the shift on which they occurred. The second part of the study examined human performance during the course of an extended (*i.e.*, longer than eight weeks) outage at eleven facilities. The data does not provide any support for the Staff’s contentions.

Data obtained from five facilities found no adverse trend in human performance beyond the sixth day worked, although such a trend would be expected based on the Staff’s claim. Similarly, other data, which was obtained from eleven plants, did not show a trend of increasing human performance errors toward the latter part of extended outages, although such a trend would again be expected if, as the Staff suggests, worker performance degrades during outages longer than eight weeks.

In SECY 06-0244, the Staff dismissed the industry’s study as “subjective and based on visual inspections of graphs of condition reports ...” SECY 2006-0244, Encl. 5 “Summary and Analysis of

Public Comments Received on Proposed Revisions to 10 CFR Part 26 – Fitness-for-Duty Programs,” at 24. The industry believes that the Staff’s dismissal of this study is unwarranted and, as Commissioner McGaffigan stated recently with regard to another rulemaking, “places the burden on licensees to engage in a sort of reverse backfit rule process to prove to the staff ... that costs vastly exceed benefits and safety gains are insignificant.” Commissioner McGaffigan’s Comments on SECY-06-0196.

The industry study used objective, real-world data collected from nuclear facility corrective action programs. Industry’s use of graphs was appropriate to look for trends, and does not render the results “subjective” or invalid. Indeed, the Staff’s refusal to accord the industry study any weight is troubling since that study did in fact assess the correlation, if any, between real-world nuclear plant shift schedules and fatigue-induced human performance errors using objective plant data. Ironically, although the Staff dismissed industry’s data as subjective, the Staff itself relies on highly subjective and anecdotal information to justify the draft final rule’s fatigue management provisions.

The Staff Has Not Demonstrated How the Subpart I “Days-off” Requirements Will Substantially Increase the Protection of Public Health and Safety

The Staff summarizes its rationale for the “days-off” requirements in proposed Section 26.205(d)(3)-(7) at page 78 of the Regulatory Analysis. Apparently the best that can be said is that these requirements “help” to: (1) “prevent and mitigate cumulative sleep debt by providing opportunities for mitigative sleep”; and (2) “provide time that individuals need to meet the many daily living obligations that they cannot otherwise readily meet . . . [such as] family interactions, exercise, recreation . . .” The backfit analysis fails to establish either that these two results will occur in response to implementation of the “days-off” requirements or that these results will “substantially increase” the overall protection of public health and safety.

As noted in the industry's December 21, 2006 letter, the "days-off" requirements in proposed Section 26.205(d)(3)-(7) provide little, if any, protection from fatigue-induced errors beyond that afforded by the other fatigue provisions of the draft final rule. The draft final rule uses a "layering" concept to defend against fatigue, for which the "days-off" provisions are the third layer, after work hours and a mandatory break period. The first layer, identified in proposed Section 26.205(d)(1), requires licensee control over the work hours of covered individuals such that they do not exceed: (1) 16 work hours in any 24-hour period; (2) 26 work hours in any 48-hour period; and (3) 72 work hours in any 7-day period. This layer also contains a mandatory 10-hour break between work periods. The first layer is adequate to prevent acute fatigue.

The second layer, identified in proposed Section 26.205(d)(2), is a 34-hour break in any 9-day period, which was added by the Staff during the public comment period on the proposed rule. The minimum break requirement is intended to defend against cumulative fatigue, understood to be an increase in fatigue resulting from inadequate rest.

The mandatory "days-off" requirements constitute the third layer. Like the second layer, it is intended to defend against cumulative fatigue. These requirements, identified in proposed Section 26.205(d)(3)-(7), specify a weekly minimum number of days off per week for a six-week shift cycle and require one day for individuals working 8-hour shifts, 2 days for those working 10-hour shifts, and 2.5 days for those working 12-hour shifts. Security personnel working 12-hour shifts are treated separately, and require 3 days off per week. (The regulations propose 3 days off every 15 days during an outage. Security personnel would be given 4 days off each 15 days.)

The 34-Hour Break

In its December 21, 2006 letter, the industry provided compelling information to support its position that the 34-hour minimum break requirement is sufficient defense against cumulative fatigue, rendering the "days-off" requirement redundant and, therefore, unnecessary. We noted that a Federal Motor Carrier Safety Administration (FMCSA) regulation governing driving hours for commercial motor vehicle (CMV) drivers was, like the NRC rule, based on a 34-hour break or recovery period. Notably, the FMCSA concluded that the 34-hour break imposed by the rule provides sufficient time to recover from cumulative fatigue.

The industry's letter also noted that defense against cumulative fatigue is further enhanced by the control of work hours in proposed Section 26.205(d)(1-2); the requirements to review actual work hours and individual performance in proposed Section 26.205(e)(1-3); the requirements to record, trend, and correct any problems in maintaining work hour controls in proposed Section 26.205(e)(4); the rights and responsibilities of all personnel and licensees related to self-declaration of fatigue problems in proposed Sections 26.203(b) and 26.209; and the requirements for fatigue assessments by supervision to detect and report indications of fatigue in the personnel with whom they interact, in proposed Sections 26.33 and 26.211.

Of course, there are numerous other NRC requirements to assure that potentially safety-significant work is done correctly (using such methods as work controls and written procedures and instructions, training and qualification, and supervision); that errors are identified and corrected (using such methods as self-verification, inspections, tests, corrective action programs and various reporting requirements); and that plants are designed and operated using a defense-in-depth philosophy that provides systems designed to prevent and mitigate accidents and protect the public from adverse consequences, including accidents, that might be caused by personnel errors. Given

these multiple layers of protection, it is not credible to posit that the "days-off" requirements will result in a substantial increase in protection.

The Staff, in response to the industry's position, states that: "The FMCSA regulations include requirements that prohibit driving after 60 hours of duty in 7 days. By contrast, the industry proposal would allow 72 hours of work in a 7-day period, excluding turnover." SECY-06-0244, Encl. 1, p. 2. In actuality, a closer examination of the FMCSA regulations shows that the 60-hour limit is imposed only on companies that operate Commercial Motor Vehicles (CMV) six or fewer days of the week. 49 CFR 395.3(b)(1). For companies that, like nuclear power plants, operate every day of the week, the FMCSA limit is 70 on-duty hours in any 8 consecutive day period. 49 CFR 395.3(b)(2). Importantly, FMCSA regulations actually allows drivers more than 72 hours of work in a week (regardless of whether their employer is on 7-day/week schedule) in that drivers are permitted to "restart" with a new 7 or 8 day period after taking a 34-hour break. FMCSA has noted that "a driver using the 34-hour recovery period could work a maximum of 77/88 driving hours or 84/98 driving and other on-duty hours depending upon which weekly rule the motor carrier operated under (*i.e.*, 60/7 or 70/8)." 70 Fed. Reg. 49,978, 50,022 (Aug. 25, 2005).

Thus, contrary to the cited statement from SECY-06-0244, the FMCSA actually allows substantially more duty-hours per week than the Staff's draft final rule, not less. Indeed, the FMCSA regulations allow even much longer hours of service for drivers in Alaska, but without the 34-hour restart provision: 20 hours/day and 80 hours/8-day period. 49 CFR 395.1(h).

In support of its challenge to industry's reliance on FMCSA's analysis, the Staff points out that: "The FMCSA's expert panel considered the 34-hour break 'absolutely minimal' for recovery with a fundamental assumption being that the 34 hours will provide the opportunity for two consecutive nights of sleep between midnight and 6 a.m. Given common outage scheduling practices and day-shift start times, no workers on nightshifts and few workers on day-shifts would meet this

assumption. Consequently, full recovery from six consecutive 12-hour shifts would not be likely for the majority of workers.” SECY-06-0244, Enclosure 1, p. 2.

The industry notes that FMCSA also understood that the 34-hour rest period would not provide workers on night shifts two consecutive sleep periods between midnight and 6 a.m. Nonetheless, FMCSA found that the 34-hour rest period was sufficient in that case to “give drivers an adequate opportunity to help minimize acute and cumulative fatigue, regardless of their driving schedule.” 70 Fed. Reg. at 50,039. Indeed, the Staff’s concern about a large number of consecutive 72-hour workweeks is focused on outages, which are generally planned periods of limited frequency and duration in which most of the workers are temporary employees who work on special outage tasks that last for much less than the full length of the outage. The Staff fails to take this into account.

The Staff’s discussion of the alleged need for required “days-off” also ignores the numerous systems, aside from the work-hour controls, that protect against safety-significant human-performance problems. These include written procedures and instructions, training workers to stop and ask if there are questions, systems for documenting conditions adverse to quality and supervision of workers. Similarly, licensees use inspections and tests extensively to prevent mistakes; control room operators use three-part communications, audible alarms, detailed records, and close supervision for the same purpose. In addition, fatigued workers have the obligation to report if they are not fit for duty. These obligations are strengthened by the new requirements imposed by proposed Section 26.209 of the final rule, whose adoption the industry supports. In the same vein, licensee supervision is obligated to assess the fitness of workers and in particular whether they are unduly fatigued. This requirement, too, is substantially strengthened by the draft final rule. See proposed Section 26.211.

The Cost of the “Days-Off” Requirements Is Substantial and Unjustified

The backfit rule provides that the NRC shall not impose new requirements unless the direct and indirect costs of the requirements are justified by the increased protection of public health and safety. 10 CFR 50.109(a)(3). As discussed above, the Staff has not and cannot demonstrate that the "days-off" requirements of 26.205(d)(3)-(7) provide a substantial increase to the protection of public health and safety. At best, the "days-off" requirements provide only a marginal additional defense against cumulative fatigue, but cumulative fatigue has not been shown to contribute significantly to the risks at operating plants. Given the limited and speculative nature of their safety-benefit, the "days-off" requirements could justify, at most, minimal direct and indirect costs. The costs associated with these requirements, however, are substantial and therefore cannot be justified.

Direct Costs of the "Days-off" Requirements

As noted on page 2, the Staff's Regulatory Analysis estimates the total annual cost of the draft final rule's fatigue management provisions to be \$41,308,794 for all fitness-for-duty program. The "days-off" requirement would account for \$16,955,400 per year. Reg. Analys., Exh. 4-4I. Thus, the "days-off" requirements comprise over 40 percent of the entire fatigue management program. Since the present worth of the fatigue management requirements is \$572,863,000 for a 7 percent discount rate and - \$898,127,000 for a 3 percent discount rate (*id.* at Exhs. 4-7 and 4-8), the total present worth of the "day-off" requirements would be estimated to be between \$229,145,200 and \$359,250,800. Such a cost is significant, and hardly could be labeled "minimal." Consequently, under the provisions of the backfit rule, whatever added protection may be attributed to the "days-off" requirements in proposed Section 26.205(d)(3)-(7), it is outweighed by the associated costs.

Indirect Costs - Labor Shortages

The Staff's cost analysis also fails to account for certain indirect costs associated with the "days-off" requirements. The Staff analysis acknowledges that the implementation of the "days-off" requirements will require licensees to obtain additional personnel for outages, but assumes that

such personnel will be available at the time, in the quantity, and with the expertise needed by any particular licensee. *See* Reg. Analys. at 31, App. 1, at I-21.

The Staff's analysis also does not consider that if the "days-off" requirements do cause labor shortages, licensees may be forced to hire less experienced persons to staff their outages. The indirect costs associated with using less experienced workers include additional training, less efficiency resulting from additional time being needed to complete tasks, and a greater potential for human-performance problems. Indeed, the Staff's analysis fails to consider the possibility that the "days-off" requirements may actually increase the incidence of human errors by causing a reduction in the average level of personnel experience.

With regard to the need for additional operators during outages, the Staff hypothesizes that licensees will be able to maintain "a pool of semi-retired, formerly-licensed, operators that work only during outages," as well as contract operator staff. Given the multitude of variables associated with the number, location, lifestyle, willingness, and availability of former operators, (as well as contract operators), it is difficult to see the Staff's basis for this assumption.

The Staff also assumes that licensees will be able to recruit the additional maintenance workers needed to make up for the effect of the "days-off" requirements at prevailing labor rates. In this regard, the Staff simply asserts "the analysis assumes that licensees will obtain additional contract maintenance staff during the period of the outage." *Id.* Objectively, this is unrealistic. The International Brotherhood of Electrical Workers (IBEW) notes in a January 22, 2007, letter to the Chairman of the NRC that "the entire [nuclear] industry is already facing a shortage of skilled, qualified workers," and cautions that "the proposed work hour restrictions and break requirements will not stabilize the current problem" and "continuing forward with the rule, as written, will compromise stable, safe, and efficient work practices and will have an onerous impact on the nuclear workforce." Contrary to the Staff's assumption, the "days-off" requirements are likely to exacerbate the shortage of outage workers by reducing the amount of overtime that workers will be

allowed to work. As a result, it will be more likely that highly skilled and efficient mechanics will give preference to jobs at non-nuclear facilities that offer an opportunity for more overtime.

In its response to NEI's concerns and the concerns raised by the IBEW, the Staff admitted that it has not established "the effect of the work hour limits on the future job seeking behavior of supplemental workers." SECY-06-0244, Encl. 5 at 1. Nonetheless, the Staff postulated that it "expects the effect [on the workforce] to be limited" because:

(1) the limits reduce the average work week by less than 5 hours while continuing to allow an average of more than 25 hours of overtime per week, and (2) the limits will not apply to all supplemental workers, only those maintaining systems, structures, and components that a risk-informed evaluation process has shown to be significant to public health and safety. As a result, the staff believes that licensees have the flexibility to manage the effect of the work hour limits on supplemental workers.

Id. These assumptions are purely speculative and contrary to the industry's experience. Industry experience is that workers are influenced by small differences in income, particularly when the alternative non-nuclear employment is in the same general vicinity.

Indirect Costs – Longer Outages

A shortage of manpower to staff outages, whether it is due to a lack of "semi-retired former licensed operators" or mechanics, may result in lengthening outages. The Commission correctly cautions that such impacts must be considered:

In analyzing impacts, the staff also has to be sensitive to the true impact (cost) to licensees. For example, the practice of allocating no replacement energy costs by claiming that the requirement can be accomplished during a regularly scheduled outage is not always practical or reasonable. In reality, the cumulative effect of all new requirements can add incremental downtime, and therefore, analysts should attribute appropriate replacement energy cost penalties to their respective regulatory actions, if appropriate.

NUREG/BR-0058, Rev. 4, at 31.

This is precisely what the Staff has *not* done here. Indeed, as the Staff analysis notes in another context, outage costs, including the cost of replacement power, can easily approach \$1,000,000 per

day. Reg. Analys. at 37. Thus, a shortage of manpower that causes a licensee to extend an outage by even a single day will have an overwhelming cost impact, far exceeding the costs for which the Staff currently takes into account.

Summary

For the reasons stated above, the Staff's backfit analysis in SECY-06-0244 fails to justify imposition of the "days-off" requirements for normal operation and outages proposed in Section 26.205(d)(3)-(7) in Subpart I of amended 10 CFR Part 26.

From: Annette Vietti-Cook
To: Billie Champ; Evangeline Ngbea; Linda Mike; Sheila McKelvin
Date: 02/12/2007 5:21:34 PM
Subject: Fwd: SECY-06-0244, "Final Rulemaking - 10 CFR Part 26 - Fitness-for-Duty Programs," Backfit Analysis

To EDO for Appropriate Action, copy to RF, RAS

>>> SECY 02/12/2007 5:11 PM >>>

>>> "FERTEL, Marvin" <msf@nei.org> 02/12/2007 4:55 PM >>>
February 12, 2007

The Honorable Dale E. Klein

Chairman

U.S. Nuclear Regulatory Commission

Mail Stop O 16 C1

Washington, DC 20555

Subject: SECY-06-0244, "Final Rulemaking - 10 CFR Part 26 - Fitness-for-Duty Programs," Backfit Analysis

Project Number: 689

Dear Chairman Klein:

On December 21, 2006, the Nuclear Energy Institute[1] <outbind://147/#_ftn1> (NEI) submitted a letter to the Commission providing industry's perspective on the October 2006 draft final rule amending NRC fitness-for-duty (FFD) regulations in 10 CFR Part 26. Subsequently, the NRC released SECY-06-0244, "Final Rulemaking - 10 CFR Part 26 - Fitness-for-Duty Programs," which provided the industry its first opportunity to review the Staff's backfit analysis for the FFD final rule. This letter addresses the Staff's backfit analysis. Based upon our review of this analysis, the amended 10 CFR Part 26, Subpart I fails to satisfy 10 CFR 50.109.

NRC Regulation, 10 CFR Section 50.109 provides that (with certain exceptions not relevant here) the NRC will require backfitting only when it determines, based on a reasoned analysis, that the backfit will substantially increase the overall protection of the public health and safety or the common defense and security, and that the direct and indirect costs of its implementation are justified by this increased

protection. Contrary to these requirements, the backfitting analysis in SECY-06-0244 fails to support a Commission conclusion that the proposed new "days-off" requirements in Subpart I are integral to achieving the purpose of the rule, that those requirements will increase the overall protection to the health and safety of the public, or that the significant costs to implement these new requirements are justified.

[1] <outbind://147/#_ftnref1> NEI is the organization responsible for establishing unified industry policy on matters affecting the nuclear energy industry. NEI's members include all entities licensed to operate commercial nuclear power plants in the United States, nuclear plant designers, major architect/engineering firms, fuel fabrication facilities, nuclear material licensees, and other organizations and individuals involved in the nuclear energy industry.

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