

Analysis of Fatigue Waiver Data for CY 2010 and 2015

As part of the NRC Fitness for Duty (FFD) Program, licensees are required to submit annual reports documenting certain aspects of their implementation of the fatigue provisions in 10 CFR Part 26. Licensees are required to report (a) the number of waivers of work hour controls issued during the calendar year, (b) whether the plant was operating or in an outage when a waiver was issued, (c) the job duty group of the individuals for whom the waiver was issued, (d) the work hour controls that were waived, (e) the number of fatigue assessments performed and the outcomes of the assessments, and (f) any program implementation problems identified and their correction. This brief provides a high-level comparison between CY 2010 and 2015 data from the annual reports and an overview of the information submitted in the CY 2015 reports.

When reviewing the information presented in this summary, it is useful to consider the number of waivers (previously referred to as deviations) routinely issued before the 2008 revision to 10 CFR Part 26 was promulgated and licensees managed work hours under the NRC's Generic Letter (GL) 82-12, "Nuclear Power Plant Staff Working Hours," dated June 15, 1982. As documented in SECY-01-0113, "Fatigue of Workers at Nuclear Power Plants," dated June 22, 2001, NEI conducted a survey during June - July, 2000, concerning deviations that licensees granted from the work hour limits in GL 82-12. The NEI survey found that approximately one-third of the survey respondents were "authorizing more than a thousand, to as many as 7,500, approvals in a year to exceed the policy guidelines."

Data Sources

For this small study, fatigue waiver data were available from two sources:

- The 2015 data were collected from the Annual Fatigue Reports (AFRs) available on line from NRC at <https://www.nrc.gov/docs/ML1629/ML16295A014.html>.
- 2010 total waiver data were obtained from the report, "Calendar Year 2010 – Fatigue Waiver Issuance Data - Statistical Analysis" draft 3 dated Sept 28, 2011, ICF International, Inc. The data used for this comparison were extracted from Exhibit IV, which listed the total number of waivers for each licensee FFD program except Entergy facilities. ICF excluded waiver data from Entergy from Exhibit IV as Entergy's licensees used considerably more waivers than other plants and were thus deemed to be outliers. The highest and lowest numbers of waivers reported by Entergy facilities were noted in the text; these values are included in this comparison.
- Waiver data from Entergy facilities not reported in the ICF report were collected from ADAMS (<https://adams.nrc.gov/wba/>) over the period January to July 2011 with the exception of Pilgrim 1 (no AFR was found in ADAMS).

To ensure completeness, the facility names were compared to a current list of operating nuclear power plants from NRC (<https://www.nrc.gov/info-finder/reactors/>) supplemented by additional information on plants that have been decommissioned since 2010 from NRC (<https://www.nrc.gov/info-finder/decommissioning/>).

CY 2010 Versus 2015

The most striking difference between CY 2010 and CY 2015 data is the reduction in the total number of waivers reported on the AFRs. The annual total number of waivers reported decreased by 3464, from 3800 in CY 2010 to 338 in CY 2015.¹ In 2010 the top five licensees reported total waivers ranging from 174 to 1143 waivers. In contrast, in 2015 the top five licensees each reported 20 total waivers. In contrast, in 2015 the top five licensees each reported 20 total waivers, except Grand Gulf, which reported 69. Waivers. Fifty-four of these waivers were for the Security Department's force-on-force exercise.

CY 2015 Observations

Based on the 2015 AFRs, the following observations were made:

1. General observations about use of the waivers:

- A little fewer than half of the licensees reported issuing waivers (31 of 72 or about 43%).
- Most were issued during operational periods (293 of 336 or about 87%) with the rest (43 of 336) issued during outages of fewer than 60 days in length. None were reported for outages over 60 days.
- The number of employees who received waivers was 198. The most waivers issued to a single individual was five.
- Most waivers were issued to maintenance technicians (81 of 198 or about 41% of individuals who received waivers). Although a large number of security personnel (68 of 198 or about 34%) were also issued waivers, many of these waivers (27 of the 68 individuals or about 40%) were due to Grand Gulf 1's force-on-force exercise. If the Grand Gulf 1 security personnel are excluded, about 47% (81 of the 171 total) of the individuals who received waivers were maintenance technicians and about 24% (41 of the 171 total) were security personnel.
- Most waivers were issued for daily work hour limits or rest breaks (244 and 74 of 338 total, respectively). The numbers of waivers and their approximate percentage of the total waivers issued for work hours were:
 - Exceed 16 hours in a 24 hour period: 84 or about 25%
 - Exceed 26 hours in a 48 hour period: 105 or about 31%
 - Exceed 72 hours in 7 Days: 55 or about 23%

The numbers of waivers and their approximate percentage of the total waivers issued for rest breaks were:

- Fewer than 10 hours between successive work periods or 8 hour break between shifts: 62 or about 18%
- Less than a 34 hour break in any 9 days: 12 or about 4%

The 20 remaining waivers represented just under 6% of the total waivers.

2. Most licensees submitted their reports using the NRC's automated PDF forms. The only AFR with internal inconsistencies did not use this form (Saint Lucie 1 and 2).

¹ One facility's AFR (Saint Lucie 1 and 2) did not correctly total – they reported 12 total waivers but had 14. Thus, there were 338 total waivers but the total of 336 is used in some places in this brief because it was not clear whether the two waivers for Saint Lucie 1 and 2 were for operating or outage conditions.

3. Where licensees chose to comment on the reasons for their waivers, the reasons were typically attributed to the following:
 - Holdover of maintenance personnel to prevent shutdown or prevent delay in safety system recovery
 - Lack of duty relief due to illness
 - Inclement weather
4. Licensees stated that fatigue assessments were performed for the following reasons:
 - Annual requirement
 - For cause (e.g., OSHA recordable event, injury, inattentiveness)
 - Post event
 - Self-declaration
 - Follow-up
 - Waiver issued (licensee did a supervisory assessment before issuing a waiver)
5. Licensees with zero waivers tended to not comment or comment minimally, e.g., “No adverse trends were noted.” Some noted that there were no conditions (e.g., refueling outage) that led to a need for waivers. Almost all noted no corrective actions were needed for fatigue management.
6. None of the licensees commented that their fatigue management programs were in any way deficient or inadequate. Some licensees made comments on fatigue management improvements, including the following:
 - Improve tracking of non-covered work hours to ensure covered work does not exceed work hour limits. A number of licensees noted that they had violations of work hour limits but had not identified them at the time to issue waivers; these were discussed in the context of the licensees’ corrective action programs
 - Improve procedures and training materials for fatigue assessment and fatigue assessment reports
 - Repeat communication of work hour requirements to staff
 - Increase the frequency of mandated reviews from annually to quarterly to provide more frequent oversight
 - Verify that work hour software and plant tracking methods result in accurate tracking and flagging of work hour restrictions