

July 10, 2003

David H. Oatley  
Vice President and General Manager  
Pacific Gas & Electric Company  
Diablo Canyon Power Plant  
9 Miles Northwest of Avila Beach  
Avila Beach, CA 93424

SUBJECT: RELAXATION OF THE ORDER, EXERCISING ENFORCEMENT DISCRETION, AND EXTENSION OF THE TIME TO SUBMIT AN ANSWER OR REQUEST A HEARING REGARDING ORDER EA-03-038, FITNESS-FOR-DUTY ENHANCEMENTS FOR NUCLEAR SECURITY FORCE PERSONNEL, FOR DIABLO CANYON NUCLEAR POWER PLANT, UNIT NOS. 1 AND 2

Dear Mr. Oatley:

On April 29, 2003, the U.S. Nuclear Regulatory Commission (NRC) issued Order EA-03-038 (the Order) modifying the operating license for the subject facilities to require compliance with the compensatory measures (CMs) related to fitness-for-duty enhancements applicable to nuclear facility security force personnel. The CMs were listed in Attachment 2 to the Order. In issuing the Order, the Commission recognized that you have voluntarily and responsibly implemented additional security measures following the events of September 11, 2001. However, work-hour demands on security force personnel have increased substantially over the past 20 months, and the current terrorist threat environment continues to require heightened security measures. Therefore, the Commission directed that the security measures addressed in Section III of the Order be implemented by licensees as reasonable and prudent measures to address issues associated with fatigue of nuclear facility security force personnel.

The Order, which was immediately effective, required responses and actions within specified timeframes. Section III.A of the Order required licensees to immediately start implementation of the requirements listed in Attachment 2 to the Order and to complete implementation no later than October 29, 2003. In addition, Section III required that licensees submit responses to conditions B.1, B.2, and C.1 in accordance with 10 CFR 50.4 within thirty-five (35) days of the date of the Order. Section IV of the Order had a requirement for a separate response that stated that in accordance with 10 CFR 2.202, the licensee must submit an answer to the Order and may request a hearing on the Order within 35 days of the date of the Order and that where good cause was shown, consideration would be given to extend the time to request a hearing.

In your letter dated, June 2, 2003, you requested a relaxation of requirements B.1 and B.2 of Section III of the Order. Section III.B.1 of the Order required, in part, that licensees notify the Commission (1) if they are unable to comply with any of the requirements described in the Order, (2) if compliance with any of the requirements was unnecessary in their specific circumstances, or (3) if implementation of any of the requirements would cause the licensee to be in violation of the provisions of any Commission regulation or the facility license. Section III.B.2 of the Order required, in part, that licensees notify the Commission if implementation of any of the requirements described in the Order would adversely impact the safe operation of the facility. Section III.C.1 of the Order required licensees to submit to the Commission a

schedule for achieving compliance with each requirement described in the Order. Further, in your letter, you asserted that you lacked a full understanding of the basis for the Order requirements and, therefore, did not respond to requirements B.1 and B.2. You requested an extension of thirty-five (35) days, from the date that the NRC provides the basis for the Order requirements, to submit the required information.

The staff did not receive your extension request before the due date to respond had expired. The staff notes that you are in violation of the Order because you (1) have not satisfied requirements contained in the Order, and (2) did not submit and receive approval of a relaxation request prior to the June 3, 2003, deadline for responding to the Order. The staff, in accordance with the Enforcement Policy and after consultation with the Director of the Office of Enforcement, has, however, decided to exercise enforcement discretion, on a one-time basis, to address the period of violation from June 4, 2003, through the issuance of this letter. The staff's decision to exercise enforcement discretion takes account of the fact that the delay in receiving the required information will not have an impact on the date for full implementation of the Order.

The NRC staff has reviewed your basis for the relaxation request and notes that you did not raise any questions about requirements contained in the Order, only the basis for the requirements. Therefore, the staff finds that you have not shown good cause for a thirty-five (35) day extension. However, as a matter of discretion, the staff grants, in part, your request for relaxation of the Order to allow additional time for your response. You are required to respond to items B.1, B.2, and C.1 of Section III in the Order and submit the required information to the NRC in accordance with 10 CFR 50.4 within fifteen (15) days of the date of this letter.

In your letter, you also requested an extension of thirty-five (35) days, from the date that the NRC provides the basis for the Order requirements, to submit an answer to the Order or request a hearing. The staff has reviewed the basis for your request and concludes that it does not satisfy the standard for good cause. However, as a matter of discretion, the staff grants, in part, your request for an extension. In accordance with 10 CFR 2.202, you must submit an answer to, and may request a hearing on, this Order within fifteen (15) days of the date of this letter.

Further, in your letter, you requested that the NRC staff provide certain information to ensure that you fully understand the underlying basis for the Order. The NRC staff provided its basis for these requirements in the Order and during the public meetings held on January 23 and February 21, 2003, where the staff discussed the details of the Order at length with representatives from the industry, well before the Order was issued, as well as in COMSECY-

D. H. Oatley

- 3 -

03-0012 (publicly available). Nevertheless, the enclosure reiterates the substance of the discussions between the staff and industry representatives prior to issuance of the Order; the enclosure does not present new substantive information.

Please contact the NRC licensing project manager if you have any questions on these matters.

Sincerely,

**/RA/**

Samuel J. Collins, Director  
Office of Nuclear Reactor Regulation

Docket Nos. 50-275 and 50-323

Enclosure: As stated

cc: See next page

D. H. Oatley

- 3 -

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*/RA/*

Samuel J. Collins, Director  
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Docket Nos. 50-275 and 50-323

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DISCUSSION REGARDING THE WORK-HOUR LIMITS  
IN ORDER EA-03-038 IMPOSING COMPENSATORY MEASURES  
RELATED TO FITNESS-FOR-DUTY ENHANCEMENTS  
FOR NUCLEAR FACILITY SECURITY FORCE PERSONNEL

**1. EXECUTIVE SUMMARY**

The April 29, 2003, Order was issued to address concerns regarding the readiness of nuclear security officers that work long periods of elevated overtime. The terrorist attacks of September 11, 2001, further sensitized the NRC to the important role that nuclear security officers perform in providing protection at commercial nuclear power plant sites. Since September 11, 2001, licensees have implemented voluntary initiatives and the NRC has imposed new security requirements that have increased the demands on the security force. Additionally, the NRC has received information that indicates that the majority of licensees utilized overtime responsibly in providing security for the site. However, numerous licensees continued to rely on elevated amounts of overtime and at a few sites the overtime usage was considered excessive. Therefore, the NRC determined that it was reasonable and prudent to establish requirements to limit security force personnel work hours as a means of providing reasonable assurance that the effects of fatigue will not adversely impact the readiness of nuclear security officers in the performance of their duties.

In developing its position, the staff considered the unique job-specific demands that are placed on nuclear security officers. Nuclear security officers are faced with making life and death decisions in the event of an attack on the site. The nuclear security officer is the first line of defense in the event of an attack on the facility with limited automatic or back-up systems to rely upon in contrast to other types of plant workers (e.g., plant operators). Nuclear security officers often work alone for long periods with limited socialization or physical activity as a stimulus. As a result, special attention must be given to the security force to ensure that the effects of fatigue do not adversely impact the readiness of nuclear security officers.

The staff is currently pursuing a rulemaking effort to address worker fatigue and propose work hour limitations for a number of types of critical job functions at commercial nuclear power plants. This effort was initiated in response to recognized weaknesses in Generic Letter (GL) 82-12, "Nuclear Power Plant Staff Work Hours." The rulemaking effort was in process when the staff initiated its specific effort regarding security force personnel. In the development of the compensatory measures (CMs) for the Order, the staff's initial proposal closely paralleled the requirements that were under discussion in the rulemaking effort. The individual limits adopted the approach taken in GL 82-12 with a few exceptions. The group limits were modified from the initial proposal as a result of external stakeholder feedback received during public meetings conducted on January 23 and February 21, 2003. The most significant change was the development of a 60-hour per week average limit for security force personnel for planned plant outages and planned security system outages which can last up to 120 days. The CMs do not impose restrictions on group work hours for unplanned outages, unplanned security system outages, or increased threat conditions which can last up to 120 days. The 60-hour limit was intended to provide reasonable assurance that the effects of fatigue would not adversely impact the readiness of security force personnel, given their unique job-specific demands, if an extended planned plant outage and increased threat condition occurred sequentially.

**ENCLOSURE**

## 2. OVERVIEW

The terrorist attacks of September 11, 2001, further sensitized the NRC to the importance of the role of nuclear security officers in providing protection for commercial nuclear power plant sites. The threat advisories issued by the NRC following September 11, 2001, and the February 25, 2002, and April 29, 2002, Orders to power reactor licensees imposing new security requirements have increased demands on the security force. The Regulatory Issue Summary on the Homeland Security Advisory System (HSAS) provides NRC guidance on security force readiness for various national threat conditions which make additional demands on security officers. Further, unlike other plant personnel, security personnel are (1) often required to work alone, (2) armed, (3) required to make quick decisions about the use of deadly force, and (4) not currently covered by GL 82-12.

Since September 11, 2001, the Commission has received reports of nuclear security officers found asleep while on duty. In addition, the Commission has received numerous allegations from nuclear security officers that certain licensees have made them work excessive amounts of overtime over long periods to deal with the post-September 11 threat environment. The nuclear security officers questioned their readiness and ability to perform their required job duties due to the adverse effects of chronic fatigue and stated that they feared reprisal if they refused to work assigned overtime. Additionally, the staff received similar information from newspaper articles and from interactions with intervenor groups. For example, the Project on Government Oversight (POGO) issued a report titled "Nuclear Power Plant Security: Voices from Inside the Fences" and submitted this report to the NRC staff (ADAMS Accession No. ML031670987). POGO interviewed more than 20 nuclear security officers protecting 24 nuclear reactors (at 13 plants) to obtain material for its report. POGO reported that security officers interviewed said "their plants are relying on increased overtime of the existing guard force."

The NRC conducted a survey to determine the degree to which licensees rely on overtime to provide security at all of the commercial nuclear power plant sites. This survey was conducted over an 8-week period in August and September 2002. The survey showed a responsible use of overtime by the majority of licensees. However, numerous licensees continued to rely on elevated amounts of overtime and a few licensees had overtime usage that was considered excessive a year after the events of September 11, 2001, and approximately 6 months after the February 25, 2002, physical protection Orders were issued.

The staff decided that it was reasonable and prudent to establish requirements to limit security force personnel work hours as a means to provide reasonable assurance that the effects of fatigue will not adversely impact the readiness of security force personnel. This decision was based on the following factors: the importance of the role of nuclear security officers in providing protection for commercial power plant sites, the staff's concern that continuing over reliance on overtime could adversely impact security force readiness, and the knowledge that additional demands would be placed on the existing security force as the staff issued additional requirements in the areas of training and the design basis threat.

There were no NRC requirements that addressed this issue prior to the issuance of the April 29, 2003, Order limiting work hours for security force personnel. GL 82-12 provided limits for work hours for other types of workers at commercial nuclear power plant sites. Specifically,

GL 82-12 provided individual limits to address the issue of acute fatigue for short periods (i.e., a day, 48 hours, and a week). GL 82-12 also contained a policy statement that a nominal 40-hour work week was expected during normal operating conditions.

The staff was aware of previously recognized weaknesses in GL 82-12 as a regulatory approach to provide reasonable assurance that fatigue will not adversely impact human performance. The staff initiated a rulemaking effort to address weaknesses in the GL 82-12 approach. The objectives of the rulemaking were to incorporate security force personnel into the scope of covered workers, minimize the use of deviations for the individual limits, and develop limits (e.g., nominal 40-hour work week) that minimize the potential for cumulative fatigue.

The rulemaking process takes time and the NRC determined that it was appropriate to act immediately to address security force personnel while the rulemaking proceeds. The Order is the most time-efficient means that the NRC has to impose immediately effective new requirements on licensees. As a result, the Commission determined that the development and issuance of an Order limiting the number of work hours for security force personnel was reasonable and prudent.

In developing the Order, the staff initially proposed CMs that largely paralleled the effort under development in the rulemaking process. The staff modified this approach based on the comments received from external stakeholders at public meetings held on January 23 and February 21, 2003.

Rulemaking activities regarding work-hour limits continue for the larger scope of commercial nuclear power plant workers that includes security force personnel. This effort will be informed, in part, by comments received from external stakeholders as well as lessons learned from the implementation of the Orders limiting security force personnel work hours. It is the staff's intention to rescind these Orders after the rulemaking activity is complete and a regulation covering security force personnel is in effect.

### **3. INDIVIDUAL WORK HOUR CONTROLS**

The individual work-hour limits establish maximum allowable work hours for security personnel and controls for exceeding the limits when necessary to maintain the security of the facility. The individual work-hour limits mostly adopt the approach taken in GL 82-12. These limits have been in place for approximately 20 years and have been the subject of substantive stakeholder input during both the rulemaking process and the development of the Order. In developing the CMs, the staff considered the information gained through these interactions. The staff increased the maximum work hours in a 48-hour period from 24 hours to 26 hours to decrease the administrative burden of approving deviations for personnel on 12-hour shifts that hold over for short periods to accommodate a delayed relief or similar circumstances. Similarly, the staff increased the minimum break period from 8 hours to 10 hours to provide greater assurance that personnel have adequate opportunity to obtain the 7-8 hours of sleep recommended by most experts in work scheduling and fatigue. Note that the staff allowed shift turnover to occur during the break period to eliminate a potential unintended consequence—an individual might rush the turnover process in an attempt to manage an individual limit. Finally, the staff established more limiting criteria for deviations from the individual limits to require assurance

that the deviation is needed to maintain the safety of the plant and to require an assessment of the individual's readiness to work beyond the individual work-hour limit.

The individual work-hour limits, with a few exceptions, follow the guidelines of the Commission's Policy on Factors Causing Fatigue of Operating Personnel at Nuclear Reactors. The policy (including the basis for the individual requirements) was the subject of a substantive review. The review is documented as Attachment 1 to SECY-01-0113.

#### **4. GROUP WORK-HOUR CONTROLS: NORMAL PLANT CONDITIONS**

The objectives of the 48-hour group limit for security personnel during normal plant operations are (1) to ensure that the amount of overtime typically worked by security force personnel does not adversely impact guard readiness during various conditions (e.g., outages, increased threat conditions, and emergencies), (2) to define an enforceable upper limit for the nominal 40-hour work-week policy stated in GL 82-12, and (3) to allow licensees to manage overtime in a manner that reflects the differing desires and capabilities of individuals with respect to work hours. The 48-hour group limit allows a reasonable amount of overtime (approximately 400 hours per year on average in addition to overtime during outages and increased threat conditions) while ensuring the readiness of security force personnel during various demands and plant conditions.

The 48-hour group limit during normal operations is the most effective mechanism contained in the CMs to provide the staff reasonable assurance that cumulative fatigue will not adversely impact the readiness of security force personnel. The 48-hour group limit includes the time required to conduct shift turnover and will restrict the extensive use of the maximum allowable individual limits during normal operations. The staff expects that under the CMs the individual limits will be used to address emergent operational issues and will not be routinely used for normally scheduled activities. In addition, the staff expects that the 48-hour group limit will minimize the need for deviations from the individual limits during normal operations. By limiting the work hours for security force personnel during normal conditions, the staff has reasonable assurance that fatigue will not adversely impact the readiness of security force personnel during outages, increased threat conditions, and emergencies. Licensees typically rely on elevated amounts of overtime during these conditions. The CMs impose only limited restrictions during these conditions to give licensees flexibility in meeting their mission, to minimize unintended consequences, and to reduce unnecessary burden. As a result of this approach, the 48-hour group limit during normal operations has an enhanced role in minimizing the overall effects of fatigue.

In addition, the 48-hour group limit is consistent with recommendations of experts for maintaining nuclear plant worker alertness, with nuclear plant worker opinions concerning overtime, with current U.S. nuclear industry practices, and with nuclear industry practices outside the U.S.

##### **4.1 Background**

A 40-hour work week during normal operations is a key element of the NRC's Policy on Factors Causing Fatigue of Personnel at Nuclear Reactors. The policy, promulgated via GL 82-12, is intended to ensure that there are enough operating personnel to "maintain adequate shift coverage without routine heavy use of overtime." Routine overtime can cause cumulative

fatigue effects, thereby degrading the ability of workers to safely and competently perform their tasks. For the purposes of the CMs, the staff developed a requirement limiting individuals to a 48-hour average, allowing 20% overtime in excess of the nominal 40-hour work week (COMSECY-02-0066). In response to stakeholder input on the draft CMs with respect to individual differences in ability and desire to work overtime, the staff developed a requirement for security personnel, as a group, to average 48 hours of work over a period not to exceed 6 weeks. Because the limit is a group average, licensees have the flexibility to distribute overtime among their staff based on their assessment of individuals' ability and desire to work overtime. The use of an averaging methodology was introduced to address licensee concern regarding the restriction of voluntary overtime.

## **4.2 Discussion**

The decision to establish a group average limit of 48 hours for normal plant conditions was based on consideration of several types and sources of information. These included past recommendations from experts and expert panels on work scheduling and maintaining worker alertness in the nuclear industry, surveys of nuclear power plant workers on their desire and ability to work overtime, data on the amount of overtime worked by security personnel, and requirements and practices in other industries.

### **4.2.1 Expert Recommendations for Maintaining Nuclear Plant Worker Alertness**

Two of the most comprehensive guideline documents on worker fatigue in the U.S. nuclear industry are Electric Power Research Institute (EPRI) NP-6748, "Control Room Operator Alertness and Performance in Nuclear Power Plants," and NUREG/CR-4248, "Recommendations for NRC Policy on Shift Scheduling and Overtime at Nuclear Power Plants." The group average requirement is a new concept developed by the staff to meet the NRC's objectives while addressing the unique circumstances and specific concerns of the stakeholders. Although neither of the documents provides specific guidelines for group averages, the documents contain information and guidelines relevant to the group average requirement.

Collectively, the shift scheduling guidelines of EPRI NP-6748 and NUREG/CR-4248 suggest a maximum routine work schedule of 44-46 hours per week. This maximum includes an assumed turnover time of 30 minutes per shift. The staff also considered the recommendations of experts concerning use of overtime. The expert panel which developed the guidelines for NUREG/CR-4248 also addressed use of overtime and recommended an individual limit of 213 hours per month (including turnover time). The expert panel emphasized that overtime should not be approved for an entire crew, indicating that this individual maximum on overtime should not be a group norm. The group average requirement of 48 hours establishes a requirement that is in the middle of the range of work hours defined by the maximum routine scheduling limits and maximum individual overtime and allows for individual differences regarding fatigue. The staff also notes that the expert panel recommended that the NRC authorize no more than 400 hours of overtime in a year. A limit of 400 hours of overtime is consistent with a 48-hour week average (i.e., 50 weeks x 8 hours).

#### **4.2.2 Nuclear Plant Worker Opinions Concerning Overtime**

In addition to considering the opinions of experts in work scheduling and fatigue, the staff considered the opinions of individuals that work in the nuclear power plant setting. These opinions were expressed in surveys conducted by the Professional Reactor Operator Society (PROS) and EPRI.

In 2002, PROS surveyed the attitudes of its members towards work hours and the development of a proposed rule concerning fatigue of workers at nuclear power plants. One of the survey questions was “What is your personal tolerance for overtime?” The responses indicated that 75% of the respondents had a “tolerance” for up to 350 hours per year. Only 13% expressed a tolerance for more than 350 hours of overtime.

The work conducted in the development of EPRI NP-6748 also included a survey of operators. The results were consistent with the PROS survey, indicating that the amount of overtime that operators wanted to work ranged from 100 to 400 hours per year. Similar results were obtained in a survey of nuclear power plant personnel in Europe.

A 48-hour week group average allows security personnel, as a group, to average approximately 400 hours of overtime, or 2400 hours of work, in a year. The group average is therefore consistent with the upper extreme of overtime hours for which nuclear power plant personnel have expressed a tolerance. In addition, the average is less restrictive than the limit implied by worker opinions because the 48-hour average excludes hours worked during an outage.

#### **4.2.3 Current U.S. Nuclear Industry Practices**

In addition to expert and worker opinions, the staff considered industry practices concerning use of overtime. As part of the process for evaluating the need for CMs to address security worker fatigue, the staff collected work scheduling data for security workers at all nuclear power plants. The data indicated that at some of the sites (31%) security personnel worked greater than 55 hours per week and at a few sites (11%) they worked 60 or more hours per week. The data also indicated that at the majority of the sites (58%) security personnel typically worked 50 hours per week or less. This suggests that a 48-hour average work week is an achievable objective though not a current practice at a substantial minority of sites.

#### **4.2.4 Additional Considerations and Perspectives**

The work-hour limits contained in the Order are comparable to restrictions on workers in other industries within the U.S. and the limits imposed by other countries that regulate overtime for nuclear power plant workers. The staff considered that cumulative fatigue of nuclear power plant workers is addressed in several other countries through individual monthly and/or annual limits on overtime. These limits, summarized in Table 6 of Attachment 1 to SECY-01-0113, are generally more restrictive than the 48-hour group average limit in that they allow fewer hours of work and provide less flexibility because the limits are applied on an individual rather than group basis (e.g., Finland limits overtime to 250 hours per year). Table 5 of Attachment 1 to SECY-01-0113 includes a summary of hourly limits on work in other industries in the U.S.

In developing the group average requirement to address cumulative fatigue of workers, the staff also considered the requirements of the European Union (EU) Working Times Directive (WTD).

The WTD establishes requirements concerning the working hours of workers across various industries in EU member nations. The staff notes that the WTD establishes a requirement that “workers cannot be forced to work more than 48 hours per week averaged over 17 weeks.” Finally, the staff notes that the amount of overtime allowed by the 48-hour group average requirement is more than the amount used in most continuous operations. Circadian Technologies, a consulting firm expert in fatigue management, regularly surveys U.S. and

Canadian companies conducting 24/7 operations. Their most recent survey (2000) of 550 major companies indicates that shift workers at 89% of the companies surveyed averaged less than 400 hours of overtime per year.

### **4.3 Conclusion**

The staff believes that the 48-hour average work week requirement for security personnel subject to the CMs establishes an appropriate upper limit for control of work hours while the plant is operating. The limit is consistent with expert and worker opinions concerning work hours, provides substantial licensee flexibility, and recognizes individual differences in the ability and desire to work overtime.

## **5. GROUP WORK HOUR CONTROLS: PLANNED PLANT OR PLANNED SECURITY SYSTEM OUTAGES**

In contrast to other plant personnel, security guard force personnel are substantially impacted by an increased threat condition given their unique job-specific demands. Nothing precludes an increase in threat condition from occurring after a planned outage. The 60-hour group limit for security personnel during planned plant or planned security system outages was established to ensure that the elevated amount of overtime typically worked by security force personnel during outages does not adversely impact guard readiness to respond to increases in threat conditions.

Ensuring that work schedules incorporate adequate break periods is an important mitigation strategy for fatigue. COMSECY-02-0066 proposed a continuous 48-hour break for periods of elevated overtime that exceed 45 days. Through stakeholder interactions, the staff concluded that a 60-hour group average was an effective alternative to implement the same objective, providing more flexibility while directly addressing the potential conjunctions of outages and increases in threat condition. The 60-hour limit ensures that security force personnel that work a 12-hour shift have 2 days off in every 7-day period. For licensees that utilize an 8-hour shift, the break between work periods built into this schedule provides reasonable assurance that security force personnel will not be adversely affected by fatigue during outages.

The 60-hour group limit allows licensees flexibility in using overtime for security force personnel to meet outage needs. Since the 60-hour limit is an average, licensees can manage overtime in a manner that reflects the differing desires and capabilities of individuals with respect to fatigue. Licensees can use the 60-hour group limit for the duration of the outage or a period not to exceed 120 days, whichever is shorter. The CMs also permit licensees to define an outage as starting up to 3 weeks prior to exiting Mode 1 to allow for outage preparations. The 60-hour limit provides reasonable assurance that elevated overtime during planned outages will not

adversely affect the readiness of security force personnel in the performance of their function during outage periods or periods of increased threat that might occur before, during, or after planned outages.

**6. GROUP WORK-HOUR CONTROLS: INCREASED THREAT CONDITIONS AND DECLARED PLANT EMERGENCIES**

No group limits were recommended for conditions of increased threat and no group or individual limits were recommended for declared plant emergencies. The staff wanted to provide licensees maximum flexibility in responding to these conditions and did not want the Order to require that nuclear security officers be sent home when they are needed most. The staff determined that the individual limits and the group limits during normal and planned outage conditions were sufficient to provide reasonable assurance that the effects of fatigue would not adversely impact the readiness of security force personnel. In addition, increased threat conditions are limited to 120 days and plant emergencies are typically of limited duration.