REDACTED REPORT

THE SECRETARY OF THE NAVY
WASHINGTON DC 20350-1000

December 5, 2011

Ms. Carolyn N. Lerner
Special Counsel
U.S. Office of Special Counsel
1730 M Street, N.W., Suite 300
Washington, DC 20036-4505

Dear Ms. Lerner:

Thank you for your letter of August 1, 2011, requesting that I investigate an alleged danger to public health and safety which was purportedly caused by valves used in a boiler plant that supports the Marine Corps Air Ground Combat Center, Twentynine Palms, California. The complainant alleges that these valves are no longer adequate to handle safely the pressure and temperature of the water now circulating in the plant's High Temperature Hot Water Generators (the Hot Water Generators).

The inquiry that was conducted by the Inspector General of the Marine Corps found that the valves in question are more than adequate to handle safely the pressure and temperature which are generated in the Hot Water Generators. Subject matter experts told the investigator that the 300-pound class valves identified by the Complainant can safely handle pressures in excess of 1,000 pounds per square inch (psi) and 850 degrees Fahrenheit, and the Hot Water Generators are not capable of producing more than 400 psi. The increased maximum pressure (rising from 160 psi to 220 psi) and maximum temperature (280 to 330 degrees Fahrenheit) that occurred over time as system demand increased still fall well within the capacity of the 300-pound class valves in question.

The investigator diligently pursued the allegation that plant workers had been injured by pressurized hot water or steam spraying from leaks in the 300-pound class valves. The subject matter experts explained that even though the valves are properly sized for the system, leaks such as those described by the complainant may be caused by normal wear which would need to be repaired through periodic maintenance. The investigator also questioned personnel who are familiar with the historical records that would reflect maintenance problems, injuries, or accidents. He was unable to develop any evidence indicating that there have been injuries, accidents, or lost time which can

be associated with burns, steam, or hot water. Audits of lost time and accident records did not reveal evidence that personnel were injured due to the high pressure release of steam or hot water.

I am enclosing two versions of the report of investigation. The first contains names of witnesses and is for your official use. I understand that you will provide a copy of this version to the President, the House and Senate Armed Services Committees, and the Complainant for their review.

Based on Department of Defense policy and relevant laws and regulations, the second version excludes the names of witnesses and is suitable for release to the general public. As has been the case with other reports that the Department of the Navy has provided to your office since September 11, 2001, I request that you make only this redacted version available to members of the public.

Again, thank you for bringing this matter to my personal attention. If I may be of any further assistance, please let me know at your earliest convenience.

Sincerely,

Ray Mabus

Enclosures:
1. For Official Use Copy of Report of Investigation
2. Public Release Copy of Report of Investigation

INSPECTOR GENERAL OF THE MARINE CORPS

IGMC Case #0006862

19 September 2011

This report has been approved by the IGMC

[redacted]

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I. Summary of Complaint

a. On 1 August 2011, the Office of Special Counsel (OSC) directed the Secretary of the Navy to conduct an investigation into allegations by [redacted] Marine Corps Air Ground Combat Center (MCAGCC), Twentynine Palms, CA that MCAGCC employees may have abused their authority and created a substantial and specific danger to public safety. The Secretary of the Navy delegated this matter to the Marine Corps. On 3 August 2011, the Inspector General of the Marine Corps (IGMC) was tasked to conduct an investigation.

b. [redacted] alleged that the 300 pound per square inch (psi) valves at the Boiler Plant, MCAGCC created a safety hazard because the valves were underrated for the capacity of pressure and heat produced by the generators.

c. In 1976, three International Lamont Controlled Circulation High Temperature Hot Water Generators were installed at MCAGCC. This system was complimented with a series of approximately 27 300lb class valves. By the late 1990s, due to an increase in population and structures at MCAGCC, the generators were required to produce more steam and hot water for the base occupants and facilities.

d. [redacted] made the allegations listed below.

1. That an increase in demand on the boiler plant in the 1990s required the generators to provide higher pressure levels, rendering the 300psi valves inadequate.

2. That the increased demand resulted in a higher psi output by the generators, which absent a coordinating enhancement of the 300psi valves, resulted in a higher frequency of valve leaks.

3. That the higher pressure (increased demand) caused the underrated valves to leak and spew 350 degree Fahrenheit water and steam.

4. That as a result of the high temperature water that leaked and spewed, some employees at the boiler plant received up to second degree burns.

5. That when valves were replaced at the boiler plant they were replaced with similar 300 psi rated valves, instead of more adequate valves.

6. That the replacement valves were manufactured in 1967 and were painted to appear new.

7. That [redacted] submitted a work order in 2000 to upgrade valves with more suitable ones, however, his request was ignored by [redacted] supervisor.

8. That a 2007 inspection by Naval Facilities Services Center - Engineering (NAVFAC-E) recommended that three 300psi isolation valves at the Twentynine Palms Boiler Plant be repaired or replaced with isolation valves with a 600psi or greater capacity, however, this was not done.

II. Conduct of the Investigation

a. On 5 August 2011, the IGMC directed an investigation. [redacted], Assistance and Investigation Division, IGMC, conducted the investigation.

b. The investigator analyzed the information provided by OSC, interviewed the complainant, witnesses, subject matter experts (SME), and reviewed all information obtained.

c. On 22 August 2011, [redacted] interviewed [redacted] Navy Facilities, (NAVFAC) [redacted] and [redacted] NAVFAC, Point Huneme, CA. Both individuals are SMEs concerning the 300lb class valve and boiler plant operations. [redacted] has over twenty-five years experience and [redacted] has over twenty years experience concerning boiler plant operations, maintenance, and inspection of various Navy and Marine Corps boiler plants. NAVFAC Engineering Service Center (ESC) is tasked with the responsibility for inspections of the MCAGCC Boiler Plant.

d. On 23 August 2011, [redacted] conducted an interview with [redacted], MCAGCC, Twentynine Palms, CA.

e. On 8 August 2011, [redacted] Navy Facilities, Norfolk, VA was interviewed concerning reported injuries by employees at the MCAGCC Boiler Plant.

f. On 24 August 2011, [redacted] Twentynine Palms, CA was interviewed concerning safety and reported lost time by employees at the MCAGCC Boiler Plant.

g. On 24 August 2011, [redacted] conducted an interview with [redacted] at the Command Inspector General's Office, Twentynine Palms, CA.

III. Summary of Evidence

a. In 1976/1977 the MCAGCC boiler plant was constructed. The boiler plant had three International Boiler Works (IBW) generators. (Note: The complaint referred to these generators as International Lamont Controlled Circulation High Temperature Hot Water Generators in original complaint). These steam generators which are still in use today. The generators have a distribution system/flow rate of below 400psi. The generators produce high temperature hot water at 395 to 400 degrees Fahrenheit.

b. After the water is heated within the generators, a system of 300lb class valves regulates the water flow. The 300lb class valves are designed to safely operate within the distribution flow rate of the three IBW generators. The 300lb class valves have psi and heat capacity that exceeds the demand of the three generators (400psi and 400 degrees Fahrenheit respectively). The 300lb class valves are capable of safely handling up to 1100psi and 850 degrees Fahrenheit. As the generators at MCAGCC have a water/steam flow rate of less than 400 psi, they are incapable of generating a psi or heat temperature that exceeds the capacity of the 300lb class valve.

c. From 1976 to approximately 2003, the boiler plant generators produced an approximate pressure of 70 psi on the secondary system and 160 psi on the primary system and a water temperature of 260 to 280 degrees Fahrenheit. From 2003 to present, as a result of additional demand, those numbers increased to 90psi on the secondary and 220psi on the primary system, with a later temperature of 320 to 330 degrees Fahrenheit.

d. Valves are not classed by their psi capacity. Valves are classified individually by their class/lbs. For instance, 150lb class, 300lb class and 600lb class valves are commonly used in boiler plants depending on a generator's distribution flow rate. The lower the temperature/distribution rate, the lower the lb class valve; the higher the distribution/ temperature, the higher lb class valve.

e. A valve is tested at 1.5 times the amount of maximum pressure capable by the generator it compliments. For example, the generators at MCGACC have the maximum ability to produce and safely maintain 400psi. Therefore, they are tested at 600psi.

f. In [redacted] complaint to OSC [redacted] referred to the valves as 300psi valve(s). As explained above this is factually incorrect because valves are not classed by psi. The class of valve is not synonymous with its psi capability. There are no 300psi valves at the MCAGCC Boiler Plant.

IV. Evidence Addressing Allegations by Complainant

a. *That an increase in demand on the boiler plant in the 1990s required that the generators provide higher pressure levels rendering the 300psi inadequate.*

1. [redacted] reported that in the late 1990s the generators at the boiler plant were required to produce more steam and hot water as a result of the increase in population and structures at MCAGCC. [redacted] stated that this increase created a demand for a higher output by the generators and alleged the 300psi valves were incapable of handling the higher psi.

2. As discussed in III (d) - (f) above, [redacted] is incorrect in referring to the valves as 300psi valves. Valves

are classified by a pound (lbs) class rating, and the pound class is not synonymous with a valves psi capability.

3. In 1976/1977 the generators produced an approximate pressure of 70 psi on the secondary system and 160 psi on the primary system and a water temperature of 260 to 280 degrees Fahrenheit. In 2003, with the greater demand due to increased population and structures at MCAGCC, those numbers increased to 90psi on the secondary and 220psi on the primary system, with a temperature of 320 to 330 degrees Fahrenheit. These parameters are still in place today. Thus, despite the increased demand, the generator pressure never exceeds the capability of the 300lb class valve.

4. The pressures discussed in paragraph c Section III are approximately one-third of capability of the valves 1100psi and 850 degree Fahrenheit rating. Thus, with the generators producing 220psi or less, the 300lb class valves with a psi rating up to 1150psi are more than adequate.

b. *That this increased demand resulted in a higher psi output by the generators, which absent a coordinating enhancement of the 300psi valves, resulted in a higher frequency of valve leaks.*

1. [redacted] and [redacted] were shown the photographs of the valves provided by [redacted]. All three SMEs provided the same information regarding to the photographs. They stated that parts within a valve sometimes fail and leak or spew steam as a result of normal wear. However, it is the responsibility of the maintenance workers and staff at the plant to conduct routine maintenance of the valves, and to repair or replace valves when they leak. They noted that the fact that a valve leaks water or steam does not mean the valve is defective, or that it is the wrong class valve; it is an indication that a part(s) within the valve need to be replaced because of normal wear.

2. [redacted] and [redacted] all stated that the valves depicted in the photographs did not leak as a result of over pressurization, but due to a mechanical failure as a result to normal wear. Thus, there is no correlation between the psi rating or the valve and any higher frequency of leaks.

c. *That the higher pressure (increased demand) caused the underrated valves to leak and spew 350 degree Fahrenheit water and steam.*

1. The IBW generators have a distribution system/flow rate of below 400psi. This means the generators are specifically designed to produce a psi of 400psi or less. This is less than the 1150psi capacity of the 300lb class valve. The generators are designed to produce high temperature hot water 395 to 400 degrees Fahrenheit. This is also less than the 850 degree Fahrenheit capacity of the 300lb class valve.

2. The distribution rate between 1976/1977 to present was approximately pressure of 70 to 90psi on the secondary system and approximately 160 to 220 psi on the primary system. The water temperatures averaged of 260 to 330 degrees Fahrenheit.

3. Over the last 35 years, the 300lb class valves were never required to exceed their capability. Any leaking is a result of the failure of the maintenance staff to inspect the valves and replace them when they show signs of wear.

d. *That as a result of the high temperature water that leaked and spewed the employees at the boiler plant received up to second degree burns.*

1. The employees at the MCAGCC Boiler Plant have a responsibility to notify management when they are injured on the job. Title 20, Code of Federal Regulations, Part 10, Claims for Compensation Under Federal Employees Compensation Act, 14 February 1975, provides language regarding employees' and/or supervisors' responsibilities to report injuries to safeguard an employee who may later make a compensation claim. It is the supervisor's duty to complete a CA-1 Form with the injured employee, and provide that documentation to the Human Resources office. Additionally, Department of Defense Instruction (DoDI) 6055.7 requires a notification to the Department of Naval Safety Division for any Class C Accident which includes any "nonfatal injury that causes any loss time from work beyond the day or shift on which it (the accident) occurred.

2. [redacted] stated that [redacted] was hired as the [redacted] on 15 March 2010, replacing the former [redacted] (the complainant). [redacted] stated there are no historical documents or records at the facility concerning maintenance problems, injuries, or accidents that may have occurred. [redacted] stated that since [redacted] was hired as the [redacted] there have been no injuries or accidents associated with burns, steam, or hot water.

3. [redacted], [redacted] and [redacted] conducted an audit for lost time due to burns reported by employees of the MCAGCC boiler plant. The audit revealed no lost time due to burns between June 2003 and July 2011.

4. [redacted] conducted an audit for reports of injury from employees at the MCAGCC boiler plant. The audit revealed no burn injuries from 1993 to present. [redacted] stated that there were other injuries reported by the boiler plant employees (e.g., back sprain, lower back pain, ankle injuries) but no injuries that were related to burns.

5. A review of MCAGCC records revealed none of the employees at the boiler plant had ever reported a burn injury.

e. *That when valves were replaced at the boiler plant they were replaced with like psi rated valves, instead of more adequate valves.*

1. The SMEs explained that when a valve leaks, it should be taken off line and repaired. Due to the highly technical aspect of repairing the valves, if substandard parts are used or maintenance personnel are not technically proficient in the intricacies of repair and replacement of parts, the valve can leak again. A complete replacement of a valve normally occurs when the repeat cost associated with repairing the valves (labor and parts) exceeds the cost of replacement.

2. The current demand placed on the 300lb class valves at the facility (90/220) is less than one third of the load

capacity that can safely be placed on the valve (1150psi). Thus, replacing a 300lb class valve with another 300lb class valve is acceptable.

f. *That the replacement valves were manufactured in 1967 and were painted so to appear new.*

1. [redacted] stated that there were no preclusions from painting a valve. [redacted] stated that because valves are exposed to moisture, in some cases the valves are painted in order to minimize the rust or corrosion of the valve, thus extending the life of the valve. [redacted] stated the fact that a valve is painted is not a violation of any standard or inspection requirement.

g. *That* [redacted] *submitted a work order in 2000 to upgrade valves with more suitable ones, however, it was ignored by* [redacted] *and* [redacted]

1. [redacted] and [redacted] stated that the reason the request was not acted on was that the 300lb class valves that were in place already exceeded the capabilities of the generators they supported. As a result there was no need to find a more suitable valve when the existing valve was more than adequate.

h. *That a 2007 inspection by Naval Facilities Engineering Services Center - Engineers (NAVFAC-E) recommended that three 300psi isolation valves at the Twentynine Palms boiler plant be repaired or replaced with isolation valves with a 600psi or greater capacity.*

1. An inspection of the MCAGCC was conducted in November 2006. Block 11 of that inspection report states that the designed pressure of the valves is 400psi, at 395 to 400 degrees Fahrenheit. Block 16 shows that the 300lb class valves were tested to 600psi, which is 1.5 times the Maximum Allowed Work Pressure (MAWP) of 400psi.

2. According to [redacted] the valves at the plant are underrated at 300psi. If this were true, the inspectors would have demanded that the valves be replaced with higher class

valves, and would not have recommended repair of the valve that was in place as a solution to the problem that they found during the hydrostatic test. Additionally, the inspectors would have recognized the extreme danger and safety violations of having an underrated valve.

3. Since 1976, three 300lb class valves were replaced with 600lb class valves. However, the SMEs explained that the valves were replaced due to management [redacted]) at that time not understanding the capacity of the 300lb class valve. The 300lb class valves that were replaced were more adequate for the pressure and heat demand.

4. [redacted] and [redacted] explained that in their inspection report issued in February 2007 that they recommended the isolation valves at the MCAGCC boiler plant be repaired or replaced with a class valve capable of handling 600psi or greater. Since the psi and temperature rating of the 300lb class valves at the facility already exceeds this capacity, the plant operators needed to either repair the existing 300lb class valve or replace with another 300lb class valve. [redacted] and [redacted] stated it would be a waste of MCAGCC funds for the boiler plant to upgrade the identified faulty valves to a 600lb class valves.

V. Additional Information

a. On 24 August 2011, [redacted] interviewed [redacted] and provided him with the technical information of the 300lb class valve including that the class of the valve was not synonymous with the psi capability of the valve. After [redacted] was provided this explanation, [redacted] agreed that the 300lb class valve was the appropriate valve at the MCAGCC Boiler Plant.

b. [redacted], the current [redacted], stated there are no safety concerns at the plant by himself or the workers, concerning the 300lb class valves.

VI. Violation or Apparent Violation of any Law, Rule, or Regulation. There were no violations of a law, rule or regulation identified as a result of this investigation.

VII. Disciplinary Action. There was no disciplinary action taken against any employee as a result of this investigation.

VIII. Referral to the Attorney General. There was no referral to the Attorney General as a result of this investigation.

X. Conclusion

a. The preponderance of evidence determined that there is not a persistent, significant, or any danger to the public at MCAGCC, nor the employees who work at the MCAGCC boiler plant due to underrated valves. The IBW generators at the plant are incapable of surpassing the capacity (850 degrees Fahrenheit and 1150psi) of the 300lb class valves currently in place.

b. This investigation revealed no information reflecting any dollar savings, or projected savings or management initiatives related to cost savings.

[redacted]