

**BEFORE THE ALASKA OFFICE OF ADMINISTRATIVE HEARINGS
ON REFERRAL BY THE COMMISSIONER OF
THE DEPARTMENT OF ADMINISTRATION**

In the Matter of:)
)
PACIFIC PLUMBING SUPPLY CO., LLC)
)
Appellant.) ITB No. 2004-1100-4286
) OAH No. 05-0303-CON

DECISION

I. Introduction

Pacific Plumbing Supply Co., LLC (Pacific Plumbing) filed a contract claim concerning a contract awarded by the Department of Fish and Game (ADFG). The contracting officer denied the claim and Pacific Plumbing filed an appeal with the commissioner of the Department of Administration. The commissioner appointed a hearing officer, and following a prehearing conference, ADFG filed its own contract claim.

A hearing was conducted in Anchorage. Following the hearing the parties submitted post-hearing memoranda and the record was closed. The hearing officer recommends that the commissioner deny the contract claim filed by Pacific Plumbing and in part grant the contract claim filed by ADFG.

II. Facts

ADFG operates a fish hatchery at Fort Richardson, in Anchorage, that provides all of the sport stock hatchery fish for Alaska lakes, valued at \$5-7,000,000 annually. Successful operation of the hatchery requires that the water entering the hatchery be heated to within 1.8° F¹ of a specified temperature during critical time periods of several weeks for each species of fish being raised. These critical time periods occur each year from March through August.

¹ Andrea Tesch, the hatchery manager, testified that the water supply to the hatchery must be maintained with 1° C (1.8° F) of the desired temperature. Eric Jensen, who designed the system, testified that .1° C temperature control was required. Because she is the hatchery manager, Ms. Tesch's testimony is adopted.

From the hatchery's inception through 2003, ADFG used waste heat from an adjacent power plant to heat the water entering the hatchery to the specified temperatures. In the spring of 2003, ADFG learned that after October, 2003, the power plant would be decommissioned and ADFG would no longer be able to use its waste heat as a heating source. ADFG began an expedited procurement process to obtain a new heating system in time for the critical time periods beginning in March, 2004. John White, ADFG's procurement officer, was in charge of the procurement. He initiated a three-part process, consisting of a professional services contract to design a boiler system for use at the hatchery, an installation contract, and an equipment purchase contract for the boiler system. Carl Ferlauto was the project manager for ADFG.

ASCG, Inc., a professional engineering firm, was awarded a contract amounting to about \$75-100,000 to design the boiler system. Mike Wolski was in charge of the contract at ASCG. On June 23, 2003, shortly after ASCG was awarded the contract,² the firm hired Eric Jensen, a licensed mechanical engineer (since 2000) with about eight years' experience with heating and ventilation systems. Mr. Jensen was assigned to the ADFG project as his first assignment. He designed a boiler system consisting of boilers, an intermediate heat exchanger, a master controller, and associated piping, as depicted in Appendices A and B.³ The boilers were connected to one side of the intermediate heat exchanger through a closed loop of piped water. The boilers heated water in the closed loop to a temperature determined by the master controller in response to the demand for heat in the hatchery water system. The water in the closed loop flowed from the boilers ("supply water") into one side of the intermediate heat exchanger, where a series of plates exchanged the heat from the water in the closed loop to the water entering the hatchery water system. The water in the closed loop then returned to the boilers ("return water") where it was reheated and the process repeated. On the other side, the intermediate heat exchanger received groundwater at a relatively constant temperature. The groundwater flow varied from 200-1200 GPM over the course of the seasons. The groundwater was

² E. Jensen Aff., 6/29/05 ¶4 [hereinafter EMJ 6/29/05]; E. Jensen Deposition p. 8, l. 23 [hereinafter EMJ].

³ Hearing Ex. 2; EMJ Ex. 22.

heated in the intermediate heat exchanger and was then provided to the hatchery water system. The hatchery water system discharged into Ship Creek.

Mr. Jensen immediately began researching boilers for use in the system. He looked for boilers that would fit the available space, deal with relatively low return water temperatures, burn efficiently, meet the heat output requirements at varying groundwater loads, and had good factory controls,⁴ preferably with a manufacturer's representative or other service personnel in Anchorage. He found about a half dozen boilers that had the potential to work in the system. He talked to a number of manufacturer's representatives, reviewed product literature, and ultimately focussed on two boilers, the Aerco Benchmark and the Lochinvar Intelli-Fin 2000. Glenn Evans, an employee of Mechanical Sales, Inc. in Anchorage, was a manufacturer's representative for Lochinvar boilers. Mr. Jensen told Mr. Evans what supply and return temperatures would be required, and Mr. Evans assured him that the Lochinvar boiler would meet those parameters and was suitable for the project.⁵ Having identified a couple of boilers as acceptable for use in the system, Mr. Jensen, with Mike Wolski and Carl Ferlauto, drafted the non-standard portions of the invitation to bid.⁶ Mr. Jensen prepared an initial set of boiler specifications,⁷ starting with the Lochinvar guide specification, and using the Lochinvar product literature as the basis of his design. Mike Wolski and Carl Ferlauto provided input before the final boiler system specification was prepared.

At the time he prepared the specifications, Mr. Jensen believed that the Lochinvar boiler was capable of controlling the supply water temperature to within 1° F of the temperature set point, based upon his conversations with Glen Evans and his review of Lochinvar product literature. In particular, he relied on a statement in a descriptive brochure for the Lochinvar boiler stating that a standard feature is "Digital Temperature Control Accurate to 1° F."⁸ Elsewhere, that same brochure states that a "single unit...is able to maintain a system temperature within 6° F of setpoint," on the same page that it

⁴ EMJ p. 10, ll. 17-25.

⁵ EMJ p. 17, l. 15- p. 17, l. 1.

⁶ EMJ p. 34, ll. 3-9.

⁷ EMJ p. 34.

⁸ Opp. to Mo. for Disp. Rel., Ex. I at 6.

states that “Lochinvar’s new temperature control [is] accurate to within 1° F.”⁹ At the time, Mr. Jensen was not aware of any boiler, other than the Lochinvar boiler, that would achieve 1° F supply water temperature control. The Aerco Benchmark is capable of 2° F supply water temperature control. Mr. Jensen elected to include a requirement for 1° F supply water temperature control in the bid specifications.

The invitation to bid was issued on July 22, 2003, with responses due nine days later, on July 31, 2003.¹⁰ The solicitation called for the supply of a multi-unit boiler system including six boilers and a master controller, and associated services including factory training, start-up and commissioning, and on-site training.¹¹ The specifications for the boilers stated, as a general requirement:

The successful bidder shall supply...a water boiler system for use in raising the temperature of process water at the Fort Richardson hatchery. This system replaces an extensive waste heat system that currently exists and will be lost in October of 2003. To meet this deadline and the constraints of installing the boilers into an existing building with limited space, the following technical specifications were developed.

Technical requirements were based on user needs, available room in the existing building, existing constraints for air intake and stack exhaust, and several other factors that limit the type, shape, and operating parameters of the boilers that can be considered.^[12]

In addition to this general requirement, the specifications included the following special requirements:

C. Boilers shall be suitable for continuous operation with return water temperatures as low as 50° F without...damage from condensation of flue gases.

D. Boilers shall have an infinitely proportional input, minimum output of 485,000 BTU/Hr at 25% input and 1,860,000 BTU/Hr. at 100% input.

...

H. Boilers shall be capable of heating supply water temperature control accurate to 1° F.^[13]

⁹ *Id.* at p. 2.

¹⁰ Ordinarily, an invitation to bid must be issued at least 21 days before the due date. However, “[i]f the procurement officer determines in writing that a shorter bid notice period is advantageous for a particular bid and adequate competition is anticipated, the 21-day period may be shortened.” AS 36.30.130.

¹¹ ITB p. 2.

¹² ITB p. 13.

¹³ In fact, 1° F supply water temperature control was unnecessary. The actual need was for supply water temperature control to within 6° F, or possibly as much as 10° F- 12° F. R. 114; EMJ at 86, ll. 3-5.

The specifications for the boilers stated:

A. General: Provide the water boilers, complete with controls and accessories, ready to operate on natural gas. Boilers shall be all pre-wired and shipped from factory as a complete system.

B. Manufacturer: Known complying products include Lochinvar Intelli-Fin Model IBN2000, having a modulating input of 500,000-2,000,000 BTU/Hr, operating on natural gas or State approved equal.

In addition, the invitation to bid stated:

A. The proper selection and coordination of all boiler room components, boiler trim, controls and all other items specified in this Section of the specifications shall be the responsibility of the boiler Manufacturer.

B. All components not furnished as a standard item shall be checked for size, design and application, and accepted as part of the boiler group.

C. The boiler Manufacturer shall guarantee all boiler components, trim and controls, even though he does not purchase or install the same.

Responses were received from Pacific Plumbing, Mechanical Sales, and FNW Alaska Pipe. Pacific Plumbing and Mechanical Sales both offered the Lochinvar boiler identified in the solicitation. Pacific Plumbing's bid of \$135,997 was low, and was accepted. A purchase order for the boilers was issued on August 11, 2003, before the installation contract was awarded. With the boiler selected and ordered, Mr. Jensen continued work on the project, preparing detailed drawings for use in the installation process. Mr. Jensen provided 35% mechanical drawings to Mechanical Sales on August 20, 2003.¹⁴ 95% mechanical drawings were sent to Mechanical Sales on September 16, 2003.¹⁵ Operation sequences were completed after the boilers were purchased.¹⁶

The figure used in the specifications reflected Mr. Jensen's understanding of the ability of the Lochinvar boilers to control supply water temperature, based on his reading of the product literature and his discussions with Glen Evans, rather than AFDG's actual need. p. 17, ll. 8-21. The required temperature control for the water entering the hatchery (not the "supply water," which is the water provided by the boilers to the intermediate heat exchanger) was 1.8° F, although better temperature control for water entering the hatchery was preferable to provide optimal growing conditions. As designed by Mr. Jensen, the boiler system included external temperature controls (*i.e.*, not associated with the boilers themselves) to achieve closer temperature control for the hatchery water than would be provided by the boilers alone.

¹⁴ EMJ p. 65, ll. 4-23; p. 81 l. 4. Mechanical Sales indicated it received an email with the drawings on August 20, 2003. EMJ Ex. 23, p. 2.

¹⁵ EMJ p. 81, l. 1.

¹⁶ EMJ p. 82, ll. 15-16.

Consistently with standard trade practice, ASCG, acting as ADFG's design professional, established a course of dealing with the manufacturer and the manufacturer's representative on all matters concerning the boiler system performance, throughout the course of the contract. The boilers were delivered to the hatchery site on October 8, 2003. Before the boilers were delivered to the site, Mr. Jensen had been informed, or should have learned, that the Lochinvar boiler was not able to maintain supply water temperature to within 1° F of the setpoint.¹⁷ The installation contractor, Mechanical Construction and Consulting, Inc., began installing the boilers on October 21.¹⁸ A manufacturer's technician arrived on November 23, 2003, and was in charge of firing up the installed boilers. The boilers were initially fired on November 23 and the technician remained on site through November 26.¹⁹

It was immediately apparent that the boiler system was not providing the desired temperature control. The manufacturer's technician's skills were limited to firing up the individual boilers and he was unable to provide any help in sequencing the system as a whole. On December 1, 2003, Carl Ferlauto, the ADFG project manager, wrote to Glen Evans, stating that the system had "serious problems" that the manufacturer had not been responsive.²⁰ He noted that the "Lochinvar sequencer [the master controller] is not maintaining water supply water temperature close enough to [the] setpoint," and that supply water variance of 25° F-30° F from the set temperature had been observed, as

¹⁷ Barry Jostol of Mechanical Sales allegedly told Mr. Jensen that the Lochinvar boiler does not control supply water temperature to within 1° F of the setpoint in mid-September. R. 215. Mr. Jensen testified at his deposition that he did not recall being told that the temperature control could not be achieved to within 1°, and that he would not have taken seriously a statement that the "temperature control display accurate to 1°" representation in the Lochinvar literature referred to the accuracy of the temperature display, and not the ability to control temperature. EMJ p. 146, ll. 17-22. His deposition testimony, in light of Mechanical Sales' assertions that it had mentioned the issue, suggests that Mr. Jensen did not believe the statements that were made to him, rather than that no such statements were made.

In light of the specific reference in the product brochure to a 6° F temperature control, Mechanical Sales' assertion that Mr. Jostol had informed him, Mr. Jensen's deposition testimony, and his responsibilities as the design professional under contract to ADFG, the preponderance of the evidence is that Mr. Jensen knew or should have known, prior to delivery, that the boilers did not provide 1° F temperature control.

¹⁸ The installation contract was for \$329,200, and included construction of the electrical distribution system, installation of the intermediate heat exchanger, all of the piping, site preparation, and other matters, as well as installation of the boiler system.

¹⁹ AR 88.

²⁰ R. 111.

compared with the 1° F figure mentioned in Lochinvar's literature.²¹ During the first week in December, Lochinvar made some programming changes to the master controller, but the boiler system's performance remained inadequate.²² On December 11, 2003, ASCG advised ADFG that it should consider taking "formal action" against "the supplier" to rectify the situation.²³

The Lochinvar control system is a customized Excel 10 system manufactured by Honeywell that is installed by the boiler manufacturer as a standard component of the Lochinvar boiler in both individual boilers and in multi-boiler systems. In a multi-boiler system, the Excel 10 control system includes a boiler controller in each boiler that controls the firing rate of that unit, and a master controller (or master sequencer) that coordinates the firing of all the units in the system to achieve maximum overall efficiency, and run-time equalization.

Mr. Jensen identified the problem in maintaining adequate supply water temperature control as stemming from the master controller.²⁴ He decided to develop a replacement controller to function in place of the factory-installed master controller.²⁵ He spent a day working on a replacement controller and on Sunday, December 14, 2003, he wired a simulator of his controls into the boiler system and conducted a test, resulting in "perfect temperature control."

On December 15, 2003, Mr. Jensen arranged a teleconference with representatives from Mechanical Sales²⁶ and Lochinvar²⁷ to discuss using a replacement controller. Lochinvar asked for another try with the boiler system after making programming changes to the master controller by modem. They made the changes and the system was fired up, but there was "no improvement" to the temperature control, and condensate began to drip through the casing of two of the boilers. The replacement controller was then used to operate the system while Lochinvar monitored its

²¹ *Id.*; see also R. 92 (extreme variance on December 3, 2003).

²² R. 113.

²³ R. 116.

²⁴ Mr. Jensen observed that "the problem is obviously the Lochinvar controls." R. 94.

²⁵ R. 117.

²⁶ Mechanical Sales's representatives were Kevin Case and Glenn Evans. R. 95.

²⁷ Lochinvar personnel participating in the teleconference were Bob Check, Barry Collins, John Pemerton, and Kevin Watts. R. 95.

performance online. Mr. Jensen, with Barry Jostol of Mechanical Sales, confirmed that using the replacement controller, it was possible to achieve the desired temperature control, with the boilers firing rate modulated to below 50% of full capacity, while maintaining return water temperature at 53°. Lochinvar did not identify any problems after observing the results of that test.²⁸ After further testing on December 16, 2003, Mr. Jensen completed the design of the replacement controller.²⁹

In the meantime, by a letter dated December 15, 2003, ADFG had notified Pacific Plumbing that it had withheld a payment because of its concerns about the performance of the boiler system and what it viewed as inadequate technical support from the manufacturer, and had urged Pacific Plumbing to contact Mechanical Sales and Lochinvar to resolve these issues.³⁰ The next day, having spoken with Larry Solomon, the president of Pacific Plumbing, ADFG authorized an additional progress payment of \$54,400, and offering to provide another progress payment if a technical solution agreeable to all the parties could be achieved.³¹ The “technical solution” contemplated at that time was the replacement controller. On December 16, 2003, Lochinvar informed ASCG in writing that the installed boiler was incapable of operating at 25% of capacity with return water temperature of 50° F, or of controlling supply water temperature to within 1° F of the set point.³² It noted that in order to avoid condensation on the primary heat exchanger, with return water temperatures below 70° F the boilers were required to fire above 25% of capacity, and with 50° F return water the boilers were required to fire at 100% of capacity: full modulation of firing was not available across the entire range of return water temperatures. Lochinvar advised ASCG that the factory-installed “control system” was designed for operations in a typical heating application, with a relatively broad band supply water temperature range, and was inappropriate for use with the very limited supply water temperature range desired by ADFG. Lochinvar suggested implementing a solution involving controlling the supply water temperature from the

²⁸ R. 95.

²⁹ R. 96.

³⁰ R. 118.

³¹ R. 119-121.

³² R. 140-141. Lochinvar’s position was consistent with statements in its service manual. Opp. to Mo. for Disp. Rel., Ex. H at 31, 67.

hatchery side of the system and offered to provide technical support for ASCG's development of "an alternative method of control."

ADFG drafted a change order to the construction contract for installation of the replacement controller.³³ Before implementing that solution and making the next progress payment, and to document the agreement of all of the parties, ADFG sought to obtain Lochinvar's formal approval of the replacement controller. On December 18, 2003, through ASCG, ADFG provided sketches of the proposed replacement controller to Pacific Plumbing, Mechanical Sales and Lochinvar. ADFG asked for written approval of the proposal and notified all three that it did not believe that installation of the replacement controller would affect any existing warranties.³⁴

On December 29, 2003, Mechanical Sales responded. It noted that Lochinvar had taken the position that the boilers were operating as designed, engineered and certified and that Pacific Plumbing should be paid in full. At the same time, it offered the support of Mechanical Sales and Lochinvar to "remedy the situation at the Hatchery."³⁵ On January 9, 2004, Pacific Plumbing contacted ADFG, indicating it believed that all of the parties had agreed on the replacement controller and that another progress payment should be made, under ADFG's prior commitment. ADFG, however, did not deem the Mechanical Sales and Lochinvar responses as satisfactory, because Lochinvar had not yet in writing specifically approved the replacement controller, and because ADFG expected to be paid for the additional costs it had incurred in developing and installing the replacement controller.³⁶

The replacement controller was installed on January 11-14, 2004.³⁷ On January 19, 2004, Lochinvar sent a letter to Mechanical Sales regarding the status of the warranty, noting that allowing the boilers to operate in a condensing mode for an extended period of time "would create a possible adverse warranty situation."³⁸ After troubleshooting and

³³ R. 125-138.

³⁴ R. 122-123, 124.

³⁵ R. 139.

³⁶ R. 142-143.

³⁷ R. 97-98.

³⁸ R. 146.

minor adjustments, by January 22, 2004, it appeared to Mr. Jensen that the replacement controller would be satisfactory.³⁹

On January 30, 2004, ADFG again wrote to Pacific Plumbing, stating that Lochinvar's letter of January 19, 2004, did not constitute approval of the replacement controller and insisting on further assurances before another progress payment would be made.⁴⁰ After reviewing wiring diagrams, Lochinvar wrote to Mechanical Sales on February 10, 2004, confirming its earlier letter of January 19.⁴¹

At this point, start-up was imminent, and the parties had not yet reached a mutual agreement. ASCG had been testing the replacement controller for a two week period, anticipating using it, and had established that using the factory-installed master controller, the boiler system was unable to produce a steady supply water temperature, even under a constant water flow, with return water temperature above 50° F, no boiler firing below 50%, and the supply water set point above 70° F.⁴² ADFG had no choice but to proceed with the replacement controller if it was to operate the hatchery at all.

However, on February 12, 2004, Mr. Jensen informed Mechanical Sales and Lochinvar that he had discovered a new problem.⁴³ The Lochinvar boiler, depicted in Appendix C, includes two heat exchangers. The secondary heat exchanger preheats the boiler return water "to control condensate formation."⁴⁴ The preheated return water is then heated in the primary heat exchanger to the desired supply water temperature. On exiting the primary heat exchanger, the supply water either enters the intermediate heat exchanger (where it heats groundwater that is then provided to the hatchery at the desired temperature), or it flows through a bypass pipe to join preheated return water exiting from the secondary heat exchanger, before the combined flow enters the primary heat

³⁹ R. 99.

⁴⁰ R. 152.

⁴¹ R. 163. The February 10 letter refers to "memo of January 16, 2004." No memo from Lochinvar with that date is in the record. It appears that the intended reference was to Lochinvar's letter dated January 19, 2004.

⁴² R. 153-154. Characterizing its findings as a "smoking gun," ASCG believed the findings called into question Lochinvar's assertion that the system's inability to maintain proper temperature control was related to varying water flows, since the temperature could not be maintained even with a constant water flow, as well as the assertion that the problem was related to the lack of full firing at low return water temperatures, since all boilers were firing at 50% or more.

⁴³ R. 164-166.

⁴⁴ Opp. to Mo. for Dis. Rel., Ex. I, p. 4.

exchanger. Entry of supply water into the bypass is controlled by a bypass valve. The bypass valve opens incrementally to allow sufficient supply water to enter the bypass pipe and mix with the preheated return water to raise the temperature of the return water entering the primary heat exchanger to at least 130° F, the minimum temperature needed to avoid condensation in the primary heat exchanger.

Mr. Jensen had discovered that each boiler's controller (not the master controller) was directing its boiler's bypass valve to close, at an 18-hour interval. This event, he believed, was a "bypass valve synchronization,"⁴⁵ was occurring over a period of about 13 minutes, including the time to close and open the valve.⁴⁶ The bypass event caused an increase in the boiler supply water temperature in the system as a whole (because of the increase in the quantity of supply water entering the system) and a decrease in the bypass water temperature in the boiler experiencing the bypass event (because no supply water was diverted into that boiler's bypass).⁴⁷ The effect was to lower the temperature of the water entering the primary heat exchanger to below 130° F, creating a risk of condensation in the primary heat exchanger, which would create dangerous corrosion.⁴⁸ Mr. Jensen notified Mechanical Sales and Lochinvar of his concerns. Lochinvar responded that the event was not bypass valve synchronization, but was a "bypass jog" that was "hard coded in the processor" and did not cause any adverse effects when the boilers were used as the manufacturer intended, *i.e.*, in a normal operating environment.⁴⁹

⁴⁵ Bypass valve synchronization is necessary for the boiler's controller to keep track of the actual position of the bypass valve. R. 199. According to the Lochinvar manual, bypass valve synchronization was supposed to occur only during periods when the boilers were not firing, at two-week intervals. *Id.* However, Honeywell personnel, and others, informed Mr. Jensen that valve synchronization must occur every 12-24 hours. R. 198.

⁴⁶ R. 196.

⁴⁷ R. 164; R. 191-192.

⁴⁸ R.174. ("Lochinvar's 'bypass jog' feature causes condensation on the primary heat exchanger which is the key concern raised by Mr. Pemerton.")

⁴⁹ R. 167. The bypass jog exercises the bypass valve in order to reduce scale buildup. According to information in the record, the bypass jog takes about 35 seconds, opens the bypass valve 10% if the valve has been continuously closed for 18 hours, and never occurs when the unit is firing. Opp. to Mo. for Disp. Rel., Ex. R, p. 3.

The preponderance of the evidence is that the bypass event is, as Mr. Jensen surmised, bypass valve synchronization, rather than a bypass jog: (1) the length of the event is consistent with synchronization, not a jog; and (2) opening the bypass valve (as occurs in the jog) would not lower the

On February 18, 2004, Mr. Ferlauto again wrote to Pacific Plumbing, stating that Lochinvar's prior responses were unsatisfactory. Mr. Ferlauto asked for confirmation that the replacement controller would not create any safety issues, and would not void the warranty on the boilers.⁵⁰ On February 20, 2004, Lochinvar responded that it "found no reason to believe that any items relating to boiler safety have been compromised," and that "there is no reason for concern regarding warranty...providing they are operated within the terms and conditions as outlined in Lochinvar's applicable written and published warranty." It added, "The operation of [the bypass jog] feature will not create any warranty issues..."⁵¹ On February 25, 2004, in response to Lochinvar's letter of February 20, 2004, ADFG released a second progress payment of \$32,764, holding back \$48,833 as compensation for its costs in design, construction and installation of the replacement controller.⁵² On February 26, 2004, the boiler system went into fully automatic operation under the control of the replacement controller.⁵³

The bypass system, with the automatically controlled bypass valve, was designed to enable operation of the boiler during low return water temperature applications.⁵⁴ Operation during low return water temperature conditions was a normal operating condition for the Lochinvar boiler; however, the operating conditions at the hatchery were outside the intended functional limits of the factory-installed control system.⁵⁵ The Lochinvar system could not achieve the desired supply water temperature control under the operating conditions at the hatchery without disabling the master sequencer controller. Disabling the master controller, however, caused condensation to occur in each boiler's primary heat exchanger during the bypass event.⁵⁶ This condition was highly damaging to the boilers. On March 10, 2004, Mr. Jensen sent an email to ADFG reporting that

temperature in the bypass pipe; and (3) Honeywell personnel confirmed that the two-week cycle referenced in Lochinvar's literature would not provide adequate valve control.

⁵⁰ R. 169.

⁵¹ R. 179.

⁵² R. 180-181.

⁵³ R. 192.

⁵⁴ Opp. to Mo. for Disp. Rel., Ex. I, p. 3.

⁵⁵ R. 140. Lochinvar also stated: "[O]ur control was not designed for an application as [Mr. Jensen] desired. ...[D]ue to flow issues and low system temperatures...the control would override the modulation of the units to protect the heat exchanger from condensing[,] causing the extreme swings in [supply water] temperature." R. 269.

⁵⁶ By March 1, 2004, ADFG had observed water puddles beneath Boiler No. 1. R. 184.

condensate was forming on all of the boilers' primary heat exchangers as a result of the bypass event.⁵⁷ On March 17, 2004, ADFG wrote to Mechanical Sales, asserting that the condensate was not the result of the use of the replacement controller, and identifying the bypass event as the cause.⁵⁸ On March 31, 2004, ADFG wrote again, asserting that the boilers did not meet the contract specifications.⁵⁹ On May 17, 2004, Mechanical Sales and Lochinvar responded to Pacific Plumbing that any problems with the boilers were attributable to ADFG, in that Mr. Jensen had been informed that the Lochinvar system did not provide the requested temperature control in September, before the boilers were delivered, and that Lochinvar operating manual states that a 50° F return water temperature requires 100% firing.⁶⁰ Lochinvar offered to provide "an option to operate the by-pass jog feature...only during boiler off cycles."⁶¹ ADFG did not accept Lochinvar's offer. It continued to operate the boiler system throughout the year with the replacement controller, achieving .1° C temperature control but with continuing condensation in the primary heat exchangers during the bypass event.

Ultimately, one of the boilers exploded and was rendered inoperable.⁶² ADFG requested technical assistance from Lochinvar, through Mechanical Sales, copying Pacific Plumbing. By follow-up direct letter to Pacific Plumbing on August 12, ADFG characterized its prior request as a warranty claim.⁶³ On October 11, 2004, Lochinvar declined to provide warranty coverage.⁶⁴

III. Discussion

A. Pacific Plumbing Provided the Equipment that ADFG Asked For.

The record indicates that the Lochinvar boilers, individually, provide temperature control to within 6° of the setpoint, but that in a multi-unit system, under the operating conditions at the hatchery, the controls (individual and master) do not allow the boiler

⁵⁷ R. 187.

⁵⁸ R. 191-197.

⁵⁹ R. 204-213.

⁶⁰ R. 215-220.

⁶¹ Lochinvar repeated its offer on February 14, 2005, at a cost of \$2,000. R. 266. Mr. Jensen deemed the offer unsatisfactory, believing that absent the bypass jog (which he characterized as valve synchronization) the system would self-destruct. R. 292.

⁶² R. 223.

⁶³ R. 227.

⁶⁴ Opp. to Mo. for Disp. Rel., Ex. U.

system to control supply water temperature within the limits needed by ADFG. There is no indication that any of the boilers was defective in workmanship. The sole reason why the boiler system did not work is that the controls were inappropriate. The central issue in this case is whether the solicitation, by identifying the Lochinvar boiler as a “known complying product,” relieved the seller from liability for the failure of the boiler system to meet the operational specifications.

1. *The Invitation to Bid Identified Lochinvar as Acceptable.*

Pacific Plumbing’s motion for summary judgement argued that that the boiler specification is a brand-specific design specification. It contended that under the invitation to bid, it was precluded from substituting another brand of boiler, and that as a brand-specific design specification, the seller is relieved of liability for providing the specified item.

The invitation to bid clearly and expressly allows the substitution of any other alternative boiler, subject to approval by ADFG. Pacific Plumbing’s argument that the invitation to bid was brand-specific is without merit.

2. *The Seller of a Lochinvar is Relieved of Liability for Non-Compliance with Specifications.*

ADFG contends that the boiler system did not meet the operational specifications set out in the invitation to bid, in four particulars: (1) ability to control supply water temperature to within 1° F of the setpoint;⁶⁵ (2) infinite modulation across the full range of return water temperatures;⁶⁶ (3) efficiency optimization;⁶⁷ and (4) continuous operation with return water temperature of 50° F.⁶⁸ Pacific Plumbing admits that the system does not meet all these specifications.⁶⁹ It argues that the contract should be interpreted in a manner that relieves Pacific Plumbing of liability for the failure of the boiler system to meet the operational specifications.

⁶⁵ Mo. for Disp. Rel. at 12-15.

⁶⁶ Mo. for Disp. Rel. at 15-16.

⁶⁷ *Id.*

⁶⁸ Mo. for Disp. Rel. at 16-18.

⁶⁹ Pacific Plumbing does not argue that the operational specifications should be read otherwise than as ADFG suggests. Rather, it contends that the Lochinvar product literature on its face shows that the Lochinvar equipment would not meet ADFG’s specifications for supply water temperature control, or for infinite modulation at low return water temperatures. Opp. to Mo. for Disp. Rel. at 7-9.

A. ADFG REPRESENTED THAT LOCHINVAR WAS ACCEPTABLE.

It is a general rule of construction contracts that when the owner provides detailed plans and specifications (“design specifications”), the contractor is relieved of liability for defective performance resulting from compliance with those specifications, but that if the contract provides for an end result (“performance specifications”), and the owner relies on the contractor to determine the means of achieving that result, the contractor is liable for defective performance.⁷⁰

Pacific Plumbing’s motion for summary judgment argued that designation of the Lochinvar boiler as a “known complying product” is in effect a design specification. ADFG responded that the contract is primarily composed of performance specifications, and that in any event the legal doctrine relied on by Pacific Plumbing applies to construction contracts, not to supply contracts. Pacific Plumbing responded that the general rule applies to supply contracts as well as construction contracts.

The parties’ dispute over whether the contract contains primarily design or performance specifications, and regarding the applicability of a general rule of construction contracts to this particular contract, obscures the question of contract interpretation that lies at the heart of the case. The fundamental question concerns the effect of the designation of the Lochinvar boiler as a “known complying product.” In that regard, at oral argument, ADFG argued that the specifications supercede the reference to the Lochinvar boiler, because the general provisions of the invitation to bid include this language:

Specifications: Unless otherwise specified in the ITB, product brand names or model numbers specified in this ITB are examples of the type and quality of product required, and are not statements of preference. If the specifications describing an item conflict with a brand name or model number describing the item, the specifications govern. ...

ADFG asserts that the reference to the Lochinvar boiler was intended as no more than an example of the type or quality of product that was desired, and thus falls squarely within this language. But the specific phrase used regarding the Lochinvar boiler is that it

⁷⁰ See, e.g., State, Department of Natural Resources v. Transamerica Premier Insurance Co., 856 P.2d 766, 772 (Alaska 1993); Fairbanks North Star Borough v. Kandik Construction, Inc. and Associates,

is a “known complying product.” This phrase indicates that the reference to a Lochinvar boiler was intended as more than an example of the type of product required, or a “brand name or model number describing the item”: it constitutes an affirmative representation that a particular item meets the specifications. In that light, the reference to Lochinvar is “otherwise specified” than as “an example of the type or quality of the product required.” Furthermore, Mr. Jensen drafted the specifications using the Lochinvar boiler as the basis of design, the specifications were tailored to his understanding of the Lochinvar features, and he intended the Lochinvar boiler to be responsive to the terms of the invitation to bid. Because the invitation to bid makes a specific, affirmative representation that the Lochinvar boiler complies with specifications, and the specifications were drafted with the intent that the Lochinvar boiler would be responsive, the general provision that specifications govern a brand name description is inapplicable. Pacific Plumbing was entitled to rely on the specific identification of the Lochinvar boiler as a “known complying product.”

B. ADFG DID NOT RELY ON PACIFIC PLUMBING.

ADFG’s motion for dispositive relief argues:

This was not a simple invitation to sell a few boiler units to [ADFG]. The responding party was required to work closely with the manufacturer of the equipment to determine the appropriate boilers, controls, valves, and other items to supply. Since the ITB required the manufacturer to assume significant responsibility..., the manufacturer had to be intimately aware of the terms of the ITB, including the operating parameters, warranty requirements and use of the equipment.⁷¹

ADFG’s characterization of the seller’s obligations ignores the solicitation’s identification of the Lochinvar boiler as a “known complying product.” Furthermore, ADFG omits any mention of its contract with ASCG, under which ASCG was to design the boiler system, draft the boiler system specifications, and “determine the best available equipment on the market.”⁷² Finally, ADFG’s argument disregards the significance of the express designation of the manufacturer as the party responsible for “proper selection

797 P.2d 793, 797 (Alaska 1990), *vacated in part*, 823 P.2d 632 (1991); J. R. Lewis v. Anchorage Asphalt Paving Co., 535 P.2d 1188, 1196 n. 19 (Alaska 1975).

⁷¹ Mo. for Disp. Rel. at 5.

⁷² Mo. for Disp. Rel. at 5, note 2.

and coordination of all boiler room components, boiler trim, controls.” The latter provision may reasonably be read to relieve a seller (other than a manufacturer or a manufacturer’s representative) from liability for providing inappropriate accessories, including controls.⁷³

The contract at issue in this case was a contract for the purchase of a boiler system, primarily consisting of boilers and controls, and the invitation to bid specified particular Lochinvar boilers as acceptable. The controls supplied were the standard controls specified in the Lochinvar literature. The purchase contract was ancillary to a construction contract⁷⁴ for installation of the boilers under which ADFG had provided detailed plans and specifications to the construction contractor. ADFG relied on ASCG, not the seller, to determine what boilers were appropriate, and on the manufacturer or manufacturer’s representative to provide appropriate controls. Neither ADFG nor ASCG relied on Pacific Plumbing to select an appropriate boiler or controls. Pacific Plumbing is not liable for breach of contract if the Lochinvar boilers that the invitation to bid asked for, with their standard, manufacturer-installed controls, are incapable of providing the desired performance.

B. Pacific Plumbing is Not Liable for Breach of the Implied Warranty of Fitness for a Particular Purpose.

ADFG asserts that Pacific Plumbing is liable for breach of the implied warranty of fitness of the boilers for a particular purpose under AS 45.02.315. Liability under that section requires not only knowledge on the part of the seller of the intended use, but also knowledge on the part of the seller “that the buyer is relying on the seller’s skill or

⁷³ The express designation of the Lochinvar boiler as a “known complying product” would not have relieved Mechanical Sales or Lochinvar from liability for the inadequate performance of the boiler controls if either of them had sold the equipment directly to ADFG, because the invitation to bid specifically placed responsibility for the boiler components, trim and controls on the manufacturer. Indeed, even without that specific provision, a manufacturer or manufacturer’s representative might have been liable for inadequate performance of the boiler system, notwithstanding designation of the boiler as acceptable, because of their superior knowledge regarding the capabilities of their own products. This conclusion is particularly apt in the context of this case, where the equipment purchase contract was an “integral part” of a construction contract. Cf. J. R. Lewis v. Anchorage Asphalt Paving Co., 535 P.2d 1188, 1199 (Alaska 1975) (in construction contract, whether it calls for end result or construction in compliance with owner’s plans, the contractor “is required to bring his expertise into play and to notify even an architect (expert) of reasonably discoverable defects.”).

⁷⁴ ADFG characterized the boiler purchase contract as “integral” to the construction contract, and the boilers as owner-provided equipment under the construction contract. R. 180.

judgment to select or furnish suitable goods.”⁷⁵ But when a contract specifies the goods to be provided, there is no implied warranty of fitness for a particular purpose.⁷⁶ In this case, the contract specified a particular boiler as acceptable, and therefore there was no implied warranty of fitness for a particular purpose with respect to the boiler.

With respect to the controller, or the boiler system as a whole, the invitation to bid provides that “The proper selection and coordination of all [boiler system components] shall be the responsibility of the boiler manufacturer.” An implied warranty requires that the seller have reason to know that the buyer is looking to the seller to select appropriate goods. To find an implied warranty of fitness for a particular purpose in the face of an express statement that the manufacturer is responsible for selecting the appropriate equipment would be directly contrary to the invitation to bid, unless the seller was the manufacturer.

Even if the invitation to bid could reasonably be read as indicating that ADFG was relying on the seller to select goods appropriate for the intended use, the invitation to bid did not describe the intended use in sufficient detail to create an implied warranty of fitness for a particular purpose. The invitation to bid states that the boiler system will be used “in raising the temperature of process water at the Fort Richardson Hatchery.” Nothing in this formulation informs the seller of the purchaser’s specific needs. To create an implied warranty of fitness for a particular purpose, the seller needs to be aware that the intended use is something other than the ordinary use of the equipment. The invitation to bid did not provide any indication that ADFG’s intended use was anything other than the ordinary use of a boiler: heating water.

C. Pacific Plumbing is Not Liable for Breach of an Express Warranty.

ADFG asserts a claim against Pacific Plumbing for breach of express warranty, relying on the express requirement in the invitation to bid that the water boiler “shall carry a one (1) year warranty against failure caused by defective workmanship or material,” with longer warranties for the heat exchanger and the burner.⁷⁷ It contends

⁷⁵ AS 45.02.315.

⁷⁶ See, e.g., Cumberland Farms, Inc. v. Drehman Flooring and Paving, Inc., 520 N.E.2d 1321, 1325 (Mass. Ct. App. 1988).

⁷⁷ Mo. for Disp. Rel. at 10-11; ITB §2.01(C).

that Pacific Plumbing could not discharge its warranty obligation simply by providing equipment covered by a manufacturer's warranty, and that Pacific Plumbing had an independent warranty obligation pursuant to the general provisions of the invitation to bid, which state that "[t]he contractor shall continue to be liable for warranty repairs for a period of one (01) year following final acceptance," and that "the contractor is obligated to fulfill its responsibilities until warranty...[has] fully expired."⁷⁸ Pacific Plumbing is also obligated to provide a replacement system under the lemon clause, ADFG argues.⁷⁹

Pacific Plumbing responds that the equipment carried the a manufacturer's warranty, and that it discharged its obligation under the contract by supplying equipment that carried that warranty.⁸⁰ Furthermore, it argues that ADFG voided the warranty by using the system with its replacement controls.⁸¹

The express contractual language merely requires Pacific Plumbing to provide equipment covered by a warranty. It does not require that Pacific Plumbing must be the warrantor. The general provisions relied on by ADFG do not expressly create a warranty, and the general rule is that a contract is construed against the drafter. In that light, the general provisions should be read as specifying the length of the required warranty, not as creating an independent warranty. Furthermore, ADFG accepted the goods with an express manufacturer's warranty, and the testimony as to trade practice and course of dealing indicates that ADFG looked primarily to the manufacturer and the manufacturer's representative for performance.⁸² For these reasons, ADFG's argument that Pacific Plumbing had an independent warranty obligation is rejected. It is therefore unnecessary to determine whether use of the replacement controls or any other actions by ADFG invalidated the manufacturer's warranty: that issue pertains to ADFG's warranty claims against Mechanical Sales and Lochinvar.

⁷⁸ Mo. for Disp. Rel. at 10; ITB at p. 5, ¶26, and p. 11.

⁷⁹ Mo. for Disp. Rel. at 11; ITB at 11.

⁸⁰ Opp. to Mo. for Disp. Rel. at 23.

⁸¹ *Id.*, at 24-25.

⁸² On the one hand, it is understandable that ADFG would have dealt directly with Mechanical Sales and Lochinvar in their efforts to obtain technical assistance, since by the time the problems materialized, ADFG was aware that Pacific Plumbing is a supplier without any technical staff. However, it is also notable that ADFG's March 31, 2004, letter effectively asserting a contract claim was directed to Mechanical Sales, and was not even copied to Pacific Plumbing. R. 204.

But ADFG's remedies were not limited to a warranty for replacement of defective equipment. The contract also contained a lemon clause, obligating the seller to supply a new boiler system if the original system failed a specified number of times. This lemon clause "takes precedence" over any warranty. The obligation under the lemon clause runs directly to the seller, and, unlike the warranty obligation, it applies even in the absence of any showing of a defect in the equipment. It is undisputed that in this case the boilers failed to meet the manufacturer's published performance specification with respect to temperature control (at most, 6° supply water temperature control), and that the boiler system failed to meet the manufacturer's published performance specifications with respect to efficiency optimization. Under the lemon clause, Pacific Plumbing was obliged to provide a replacement system. ADFG may pay the remainder of the purchase price and demand an identical replacement system (for which it might attempt to customize controls suitable to its intended use), or in lieu thereof, at ADFG's option, Pacific Plumbing can refund the monies it has been paid for the system that was installed.

D. Pacific Plumbing Acted in Good Faith.

There is no evidence that Pacific Plumbing acted in bad faith. The essence of ADFG's argument is that Pacific Plumbing's interpretation of the contract is unreasonable, and that Pacific Plumbing could not reasonably rely on Mechanical Sales or Lochinvar to provide the necessary training and technical support. But the testimony at the hearing was that this is routine in the trade, and that buyers and sellers alike routinely rely on the manufacturer or the manufacturer's representatives for service. Even if the contract obligated Pacific Plumbing to provide those services, there is no indication that relying on the manufacturer to provide them was either commercially unreasonable (since it was consistent with trade practice and the course of dealing), or that it was the result of bad faith (for the same reason).

F. ADFG Did Not Establish a Material Breach of Contract as to Other Items.

1. *Submittals*

ADFG asserted in its motion for summary judgment that Pacific Plumbing failed to provide (a) test results of the boiler system under actual load conditions, and (b) records of the qualifications of the start-up personnel.⁸³

The contract does not require the manufacturer's test results to be included in the submittals with the equipment. Rather, it states that the boilers must have been pre-tested "under actual load conditions" at the factory, and that the seller must "[p]rovide certified copies of all factory performance tests."⁸⁴

ADFG asserts that the factory test results submitted with the equipment did not show the results of testing under actual load conditions. Mr. Jensen testified at his deposition that the reports of "pressure testing," which ADFG did receive, is not the same as testing "under actual load conditions."

It appears from Mr. Jensen's testimony that he believed the contract called for start-up of the units at the factory. However, a reasonable reading of the contract is that testing that simulates actual loads is sufficient, and that pressure testing substantially complies with that requirement. ADFG did not establish by a preponderance of the evidence that the results of the tests it received were a material breach of contract.

The contract required the seller to provide "detailed qualification record for system start-up individuals."⁸⁵ Pacific Plumbing did not dispute that it failed to provide these records.⁸⁶ But ADFG has not alleged that it suffered any damages as a result of this failure. The record establishes that after the initial start-up, Mechanical Sales and Lochinvar tried and failed to get the system to work, using their most highly competent personnel, and there is no evidence that ADFG was damaged by Pacific Plumbing's failure to provide the start-up technician's qualification records. The failure to provide qualification records for the system start-up technician was immaterial.

⁸³ Mo. for Disp. Rel. at 20, relying on EMJ 6/29/05 at 5, ¶10.

⁸⁴ ITB §1.04, §1.05(D) (R. 14-15).

⁸⁵ ITB §1.04(b)(8) (R. 14).

⁸⁶ Opp. to Mo. for Disp. Rel. at 20.

2. *Training*

The contract required that the seller provide “[f]actory training for two (2) individuals, all expenses paid”⁸⁷ within three weeks of a request.⁸⁸

The parties agree that one ADFG employee received the required training, in October, 2003. The record does not indicate why only one individual was trained at that time. Subsequently, after ADFG withheld payment of a progress payment, in December, 2003, Mechanical Sales refused to provide training for a second ADFG employee.⁸⁹ Pacific Plumbing did, however, attempt to arrange training once the progress payment was made, in February, 2004.⁹⁰ There were some scheduling problems after that,⁹¹ but ADFG did not establish by a preponderance of the evidence that training was thereafter denied for any reason.

At the time that Mechanical Sales denied training, ADFG had withheld a progress payment from Pacific Plumbing. ADFG took the position that withholding payment should be treated as a separate issue than training, but Pacific Plumbing, to the extent it was entitled to a progress payment,⁹² would have been within its rights to decline to pay for training. Since the right to a progress payment depends on whether Pacific Plumbing was in breach with respect to the delivery, ADFG’s claim on this point is subsidiary to its claim of breach. Having found no breach of contract, the claim is denied.

IV. **Conclusion**

The boiler system that was installed at the Fort Richardson Hatchery was incapable of providing the necessary performance because the manufacturer’s controls were inappropriate. Ultimate responsibility for that failure may lie with the consulting design engineer, the manufacturer, or with the manufacturer’s representative, but the contract between ADFG and Pacific Plumbing did not place the risk of loss from those failure on Pacific Plumbing.

⁸⁷ ITB at 3 (R. 2).

⁸⁸ ITB §2.02 (R. 17).

⁸⁹ R. 181; AT p. 2, ¶5.

⁹⁰ R. 185.

⁹¹ LS p. 38, ll. 11-17.

⁹² The contract appears to require payment in full within 30 days of delivery. ITB at 7.

Tort damages, such as those claimed by ADFG, are unavailable in an administrative contract claim filed under AS 36.30.620, which is primarily intended to provide the parties to the contract with a mechanism for interpreting and enforcing the contract's terms (e.g., payment or refund of sums due or not owed; performance in accordance with the contract terms).⁹³ In this case, ADFG's contractual remedy is the lemon clause. Pacific Plumbing is entitled to be paid for the system it provided, because that is the system ADFG asked for. But because the system failed, ADFG is entitled to a new one. At ADFG's election, Pacific Plumbing is directed to provide an identical replacement system (upon payment of the remainder of the contract purchase price), or to return the money it was paid.

DATED April 26, 2006.

Andrew M. Hemenway
Administrative Law Judge

ADOPTION

The undersigned, on behalf of the Commissioner of Administration and in accordance with AS 36.30.675 adopts this decision as the final administrative determination in this matter.

Judicial review of this decision may be obtained by filing an appeal in the Alaska Superior court in accordance with AS 36.30.685 and the Alaska Rules of Appellate Procedure, within 30 days after the date of the adoption of this decision.

DATED: 4/27/06

Mike Tibbles
Deputy Commissioner

CERTIFICATE OF SERVICE

The undersigned certifies that on April 27, 2006,
a copy of the foregoing document was served by U.S. mail on:

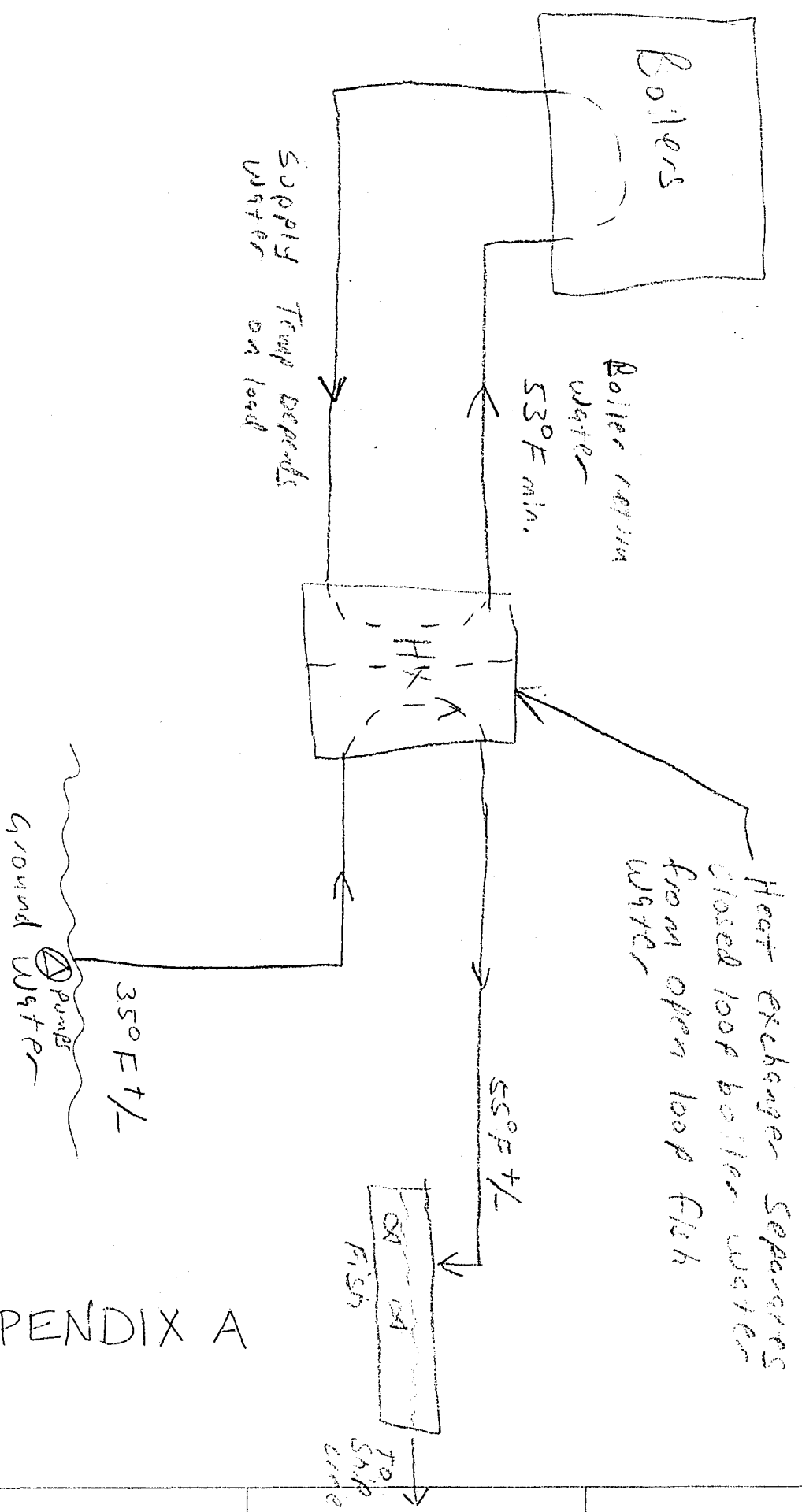
Assistant Attorney General Larry McKinstry
Department of Law

Brian J. Stibitz, Attorney at Law
Bankston Gronning O'Hara, P.C.
601 West 5th Avenue, Suite 900
Anchorage, Alaska 99501

~~PO Box 110300~~ 1031 W. 4th Ave. Ste. 200
~~Juneau, Alaska 99811-0300~~ Anchorage, AK 99501

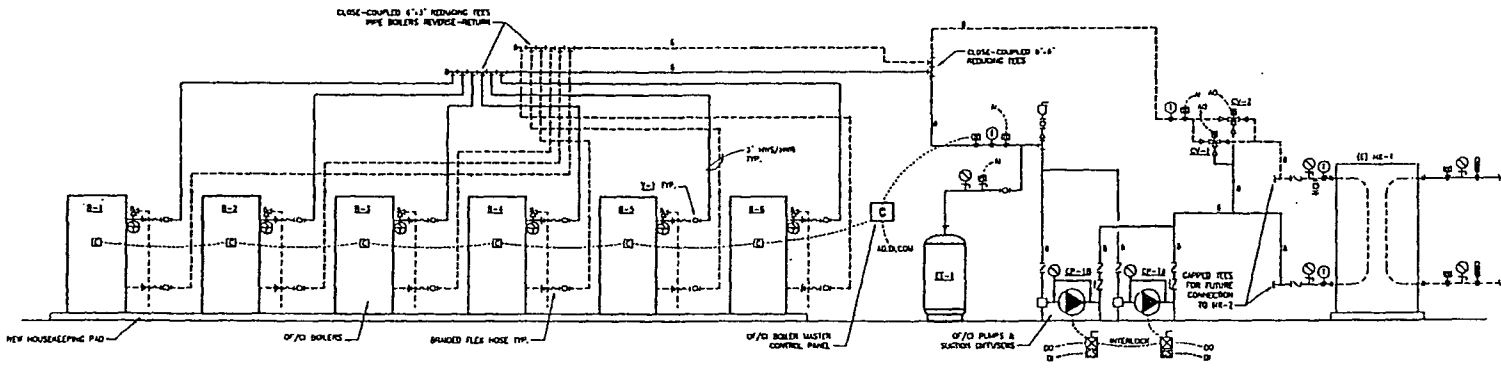
Kim Rechin, Paralegal I

⁹³ Additional remedies in the form of consequential damages or otherwise may be available in a claim filed under AS 44.77. See, e.g., State, Department of Natural Resources v. Transamerica Premier Insurance Co., 856 P.2d 766, 771 (Alaska 1993) (remanding claim for consequential damages filed under AS 44.77).

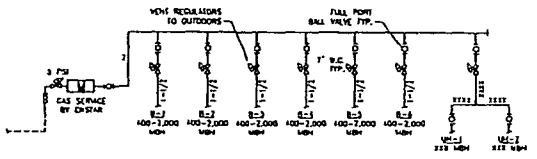


Hearing Exhibit #2

APPENDIX A



1 PIPING & CONTROL DIAGRAM
M3.1 SCALE: NONE



2 GAS PIPING DIAGRAM
M3.1 SCALE: NONE

APPENDIX B

35% SUBMITTAL

No.	DATE	DESCRIPTION	BY

ASCG
INCORPORATED
ENGINEERS - ARCHITECTS - SURVEYORS - PLUMBERS
260 C STREET, SUITE 201 • ANCHORAGE, ALASKA 99501-1917



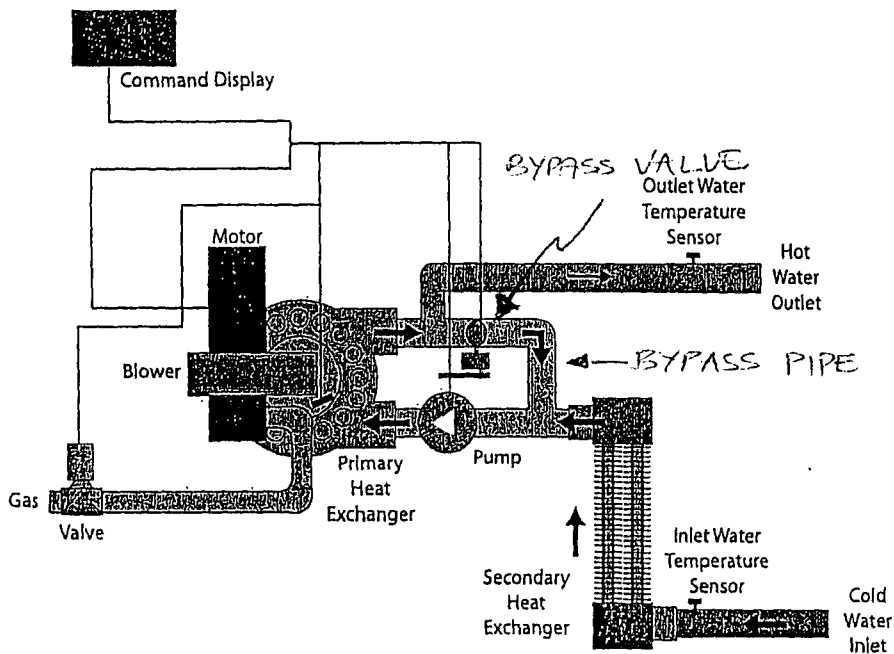
STATE OF ALASKA
DEPARTMENT OF FISH
AND GAME

MECHANICAL
DETAILS & DIAGRAMS

FORT RICHARDSON BOILER SYSTEM
FORT RICHARDSON, ALASKA

FULL SIZE SCALE:	DATE:	M3.1
HALF SIZE SCALE:		

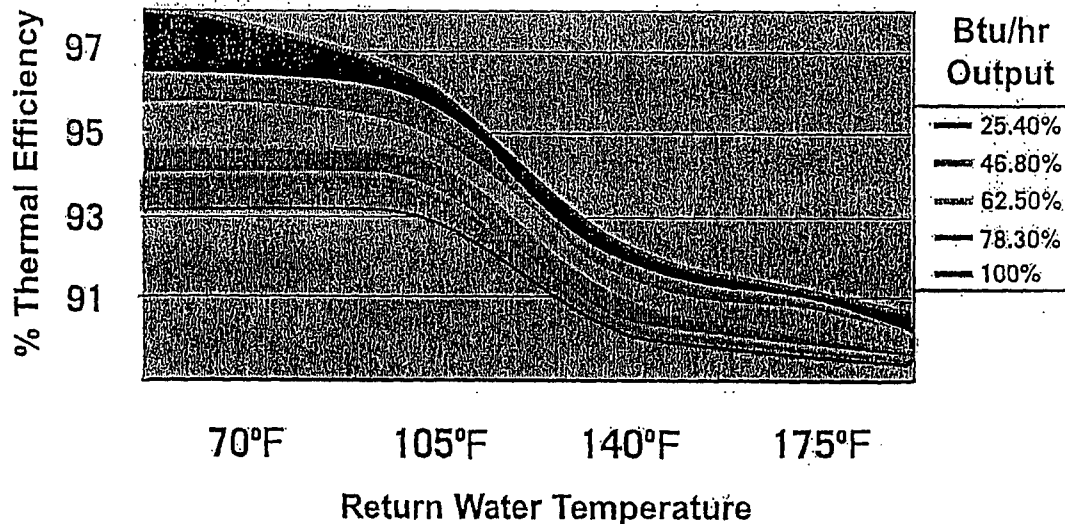
Intelli-Fin® Operating Schematic



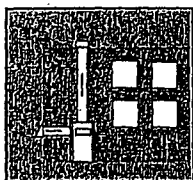
Intelli-Fin can operate with a broad range of gas pressure and water temperature situations thanks to its intelligent controls and unique heat exchanger arrangement. The dual heat exchanger arrangement preheats return water to control condensate formation. Using a pumped bypass, a portion of the heated supply water is recirculated to raise inlet temperature to a point where condensation on the primary heat exchanger is avoided. In addition, gas and air supply for combustion are also adjusted to ensure sufficient Btu/hr output to raise supply water temperature to the prescribed set point.

Intelli-Fin Efficiency Data at Firing Rate

Intelli-Fin provides thermal efficiency ratings as high as 97%. Because of its ability to infinitely modulate operation, efficiency is maintained at maximum levels to provide lowest total operating cost.

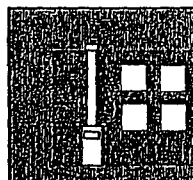


Venting Options



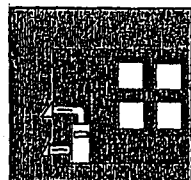
Intelli-Vent Vertical

Vents vertically up to 100 equivalent feet. Directly draws combustion air 100 equivalent feet from a side wall.



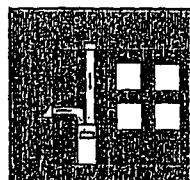
Vertical

Vents vertically using Category IV approved vent material.



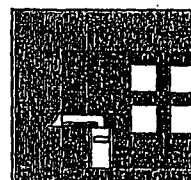
Direct Vent Horizontal

Vents horizontally up to 100 equivalent feet. Directly draws combustion air 100 equivalent feet from a side wall.



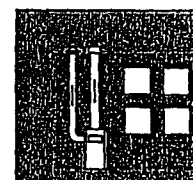
Intelli-Vent Horizontal

Vents horizontally up to 100 equivalent feet. Directly draws combustion air 100 equivalent feet from the roof top.



Sidewall

Vents horizontally up to 100 equivalent feet.



Direct Vent Vertical

Vents vertically up to 100 equivalent feet. Directly draws combustion air 100 equivalent feet from the roof top.

APPENDIX C

See Install

Appellant/Claimant