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The Pothole Lake Fire: An analysis of emotion in a successful emergency response

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An Analysis of Emotion in a Successful Emergency Response

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QUICK RESPONSE RESEARCH REPORT #64

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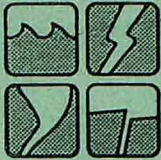
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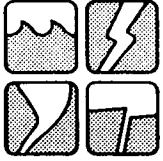William A. Wallace

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ABSTRACT

This study explores the emotional content of an effective disaster response situation and its coordination by the Incident Command System. Twenty-seven firefighters and local residents were interviewed during a major wildfire in 1991. The resulting videotapes were transcribed, coded, and analyzed for their emotional content. Results indicated that a variety of factors led to the success of the disaster response effort, including the use of the Incident Command System, luck, the nature of the disaster, and the cooperation of the town and local agencies. This methodology is recommended for future case studies researching emotions and crises.

INTRODUCTION

This study is part of an ongoing research project (Carley, Harrald, and Wallace, 1993) exploring the relationship among information technologies, emotion, and decision-making. Our objective in this portion of the research is to explore the emotional content of an effective disaster response situation and its coordination by the Incident Command System. Our aim is to provide a benchmark, and emotional profile, to be used as a baseline for future analyses of this type. One of the authors (Cohn) conducted twenty-seven videotaped interviews with firefighting staff and local residents during the Pothole Lake Fire #103108 in the Kenai Peninsula near Cooper Landing, Alaska. We will analyze the interviews using content analysis in combination with Heise's evaluation ratings for emotion-related words.

Effective disaster response requires rapid decision-making under stress. Decision-making skills can be enhanced or hindered by human psychological responses to disaster. On the one hand, an emergency situation can produce increased confidence in and commitment to a course of action; people "rise to the occasion." On the other hand, disasters can cause people to hesitate or to become immobilized and can lessen creativity, especially in terms of considering potential solutions (Carley, Cohn, Harrald, and Wallace, 1993). This study is unique in that it represents a codification of interview data collected during, not after, an effective disaster response situation. The advantage of immediate data collection is that written or verbal reports of an event that have been generated from memory are subject to distortion in terms of both facts and emotions. Using a performance evaluation of the ICS team, as well as residents' comments from the interviews, we will demonstrate that this response effort was generally well-received and thought to be successful.

Heise (1977) has noted that evaluation (good versus bad), potency (powerful versus powerless), and activity (active versus passive) are dimensions of affective response common to people around the world, even when they come from different cultures and speak different languages. He developed a dictionary of affect-related words to which he was able, through his research, to assign ratings ranging from -4 to +4 on each of the three dimensions. In our

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research, we wanted to explore the range of positive to negative emotions present during the Pothole Lake Fire; therefore, we used ratings from Heise's evaluation dimension to extract emotional content from text.

THE POTHOLE LAKE FIRE

Fire Suppression in Alaska

Because Alaska contains large areas of undeveloped, sparsely populated land that is relatively inaccessible, the state relies on a decade-old master fire management plan to determine appropriate response to fires (Enders, 1991). Naturally occurring wildfires often are beneficial, clearing the way for new growth of grasses and shrubs, thus providing new food sources for animals such as foxes, birds, and moose (Reeves, 1991). Areas are designated for full, modified, or limited fire suppression, depending on how desirable or undesirable fire in those locations would be (Enders, 1991). Areas designated for limited fire suppression are locations where the benefits of fire outweigh risks to resources. Fires often help restore the health of ailing forests; when fires are suppressed, the forests age and become susceptible to insect attacks (Kizzia, 1991).

Three agencies fight fire in Alaska: the Alaska Fire Service, an agency of the federal Bureau of Land Management; the State of Alaska Division of Forestry (DOF); and the United States Forest Service. Fires occurring along the limited road networks usually are handled by the DOF. The Alaska Fire Service manages fire suppression in Alaska's less accessible areas. Backup crews are called in from the Lower 48 when necessary (Enders, 1991). All of these agencies have selected and adopted the Incident Command System as a means of organization for fighting fire (Lien, 1993). All personnel who work for these agencies are trained in ICS firefighting methods and know when an ICS team needs to be mobilized. In order to call in an ICS team, authorities contact the DOF in Anchorage, which in turn call the Alaska Interagency Fire Coordination Center (AIFCC) to request the type of team needed. The AIFCC has three established Type II teams (teams trained to respond to moderately severe fires) on a two-hour call. All personnel on these teams work for either the US Forest Service or the State of Alaska Division of Natural Resources. Wages for a firefighter's first eight hours on an incident are paid by that firefighter's employer. After that, all wages and expenses are paid by the owner of the land on which the fire is being fought. In the case of the Pothole Lake Fire, the expense was borne by the United States Forest Service (Lien, 1993).

Description of the Pothole Lake Fire

The Pothole Lake Fire was first reported on May 19, 1991 as covering about ten acres near Pothole Lake in the Kenai Peninsula in southern Alaska. Because the fire started in a limited suppression zone, it was monitored and allowed to burn freely for the first few days (Kizzia, 1991). The fire, which authorities think may have been started by local bear hunters (Enders, 1991), fed on spruce trees that had been killed by beetles. Several days later, the fire had

grown to fifty acres and then suddenly ballooned to eight hundred, threatening the town of Cooper Landing and the Kenai and Russian River fishing grounds. By May 24, the fire was declared to be at the Class II level, and its size was estimated at 3600 acres. On May 27, when the fire was mapped at 8400 acres (later remapped to 7900 acres), a Class I team, which consists of the most experienced fire suppression staff, was called in. Campgrounds and highways were evacuated, and public meetings were held daily for residents of the town of Cooper Landing (Cohn and Wallace, 1991). Firefighting crews worked to build a line around the perimeter of the fire. A wind shift, cooler temperatures, and higher humidity assisted the firefighting effort. On June 1, the fire was declared contained, and on June 3, the fire was declared controlled. On June 4, the fire was reduced to Class III and then was turned over to local fire authorities on June 23. Isolated hot spots continued to be monitored for several months, until the fire was declared completely out on October 31, 1991 (Fire Narrative, 1991). 650 personnel from thirty crews had fought the fire (Fire Overhead Performance Rating, 1991).

FIELD RESEARCH

The fire-related personnel and activities were observed by Cohn from May 30, 1991 to June 4, 1991, while the Pothole Lake fire was in progress. She had access to all firefighting and support personnel and videotaped interviews with firefighters, support staff, local residents, and land managers, as listed in Table 1.

In-depth interviews were conducted using non-directive open-ended questions in a flexible format to gather descriptive data in the interviewee's own words. Sample questions included:

"What's your name?"
"What is a smoke jumper?"
"Anything particularly unique about this situation here?"
"What kind of concerns does a populated area present for a fire management?"
"What's the experience been for you and the crew on this particular incident?"
"Have you done this for a long time?"
"Are there any unusual circumstances with this particular incident?"
"What does resource management mean?"
"Is this your first fire in Alaska?"
"How has it been working with these interagency teams from different organizations?"
"After this, what will you be doing this summer?"
"How'd you hear about this fire?"
"How did the crew handle that kind of situation?"

Sometimes reflective comments were made to encourage the interviewee to continue talking:

"Moving camp certainly sounds like a real challenge."
"You've done a lot of travel."
"So you were literally jumping in the fire."

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"Sounds like that was quite an experience for the crew."

The responses obtained varied depending on the interviewee's verbal ability, willingness to be interviewed, and comfort level with being videotaped. We expected to find a significant amount of visible distress surrounding such a threatening incident and was surprised to hear most interviewees express satisfaction with the progress of fire suppression activities. We attribute this initial finding to the staff's hours of training, to their years of experience, and to the smooth operation of the Incident Command System.

The interviews averaged 19 minutes in length and ranged from one minute to 84 minutes. The 8-millimeter videotape was transcribed to diskette with one file for each interview. Various lists, plans, directories, maps, and newspaper articles from the Anchorage Daily News and the Anchorage Times were also collected.[3]

Insert Table 1 here.

THE INCIDENT COMMAND SYSTEM: STRUCTURE AND PHILOSOPHY

The Incident Command System (ICS), originally developed in response to large fires in Southern California in 1970 (Hazardous Materials Operations for First Responders, 1990), is a national paramilitary emergency response network that can be mobilized to manage emergencies of any type. The system consists of a group of procedures for managing personnel, equipment, facilities, and communications during an emergency (New Jersey Hazmat Emergency Response Course, 1990). It is military in its tightly hierarchical structure and minimal span of control, while the unified command structure of local agency officials and residents is distinctly non-military, as is its completely voluntary aspect: anyone can quit at any time. It is important to emphasize that ICS is a response system, a protocol, rather than an existing ongoing organization.

Administratively, ICS is part of the National Inter-Agency Incident Management System (NIIMS), a branch of the Federal Emergency Management Association (FEMA). NIIMS is an umbrella organization intended to provide a common system to be used by risk management agencies (including, but not limited to, fire protection organizations) at all levels.

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[3] These data are available from Professor W.A. Wallace, Decision Sciences and Engineering Systems, Rensselaer Polytechnic Institute, Troy, NY, 12180-3590.

Within NIIMS are the National Inter-Agency Fire Qualifications system (NIFQS) and ICS. NIFQS develops training courses for positions within ICS as well as standards for certification and qualification.

ICS, built cooperatively by local, state, and federal agencies, is based on the structure of a large fire organization, as developed by Federal fire protection agencies. Unlike most fire organizations, however, ICS is designed to be used for different kinds of emergencies, and for incidents of varying sizes. Local emergency management personnel have plans in place to mobilize teams as needed for emergencies of different kind and scope. Teams are classified according to the type of emergency they are qualified to respond to. Federal law requires that ICS be used to manage hazardous materials incidents (Hazardous Materials Operations for First Responders, 1990). At the present time, Alaska has only firefighting ICS teams, although the Bureau of Land Management is working on developing a cross-trained all-risk team. The United States Park Service has a standing all-risk team (Lien, 1993).

The basic philosophy of ICS addresses scope, organizational structure, and operating principles. ICS can operate in a single location or over multiple jurisdictions, with one agency or many, and must be able to function in any area of the country. Its organizational structure must be adaptable to emergencies caused by "fires, floods, earthquakes, hurricanes, tornados, tidal waves, riots, spills of hazardous materials, and other natural or man-caused incidents" (The Incident Command System and Structural Firefighting, 1984, B-6.). Its hierarchical structure must be able to expand and contract effectively as required by the changing scope of the incident. ICS should be able to adapt to new technology and should be internally consistent in regard to organization, terminology, and procedures. One of ICS's top priorities is to cause as little disruption as possible to the communities and systems within which they work. Finally, ICS must be able to meet all of the above requirements while maintaining low operational expenses.

The ICS structure for any given incident is unique to that incident and is constructed in a modular fashion. The Incident Commander (IC) builds the organization's staff from the top down. The IC appoints Section Chiefs who become responsible for all further development of their section. Sections which may be created as needed are Operations, Planning, Logistics, and Finance. Each section may have up to three sub-levels: Branch, Division, and Unit. An Incident Command team can be staffed by personnel from a variety of emergency services and agencies: firefighters, Red Cross personnel, medical personnel, local emergency management officers, or hazardous materials experts.

Integrated communications are managed by the Communications Unit in the Service Branch of the Logistics Section; media may include radio networks, on-site telephone, public address, and off-site systems. Separate radio networks are organized by function for the following areas: command, tactical, support, ground to air, and air to air. All communications are in plain English, and no codes are used.

When an incident occurs, and local emergency management resources are not adequate, one

or more agencies may call in an ICS team. Incidents that cross jurisdictional boundaries or involve multiple agencies require a unified command structure, in which all agencies involved participate in determining the overall objectives in managing the incident. Together, they select strategies and plan tactical operations in such a way as to use resources with maximum efficiency. The unified command structure usually consists of key officials from each jurisdiction or department heads from different areas within a single jurisdiction, and it may include local landowners as well. Although the unified command structure as a group is responsible for planning, the implementation of the plan is directed by the Operations Section Chief, who generally comes from the agency with the greatest jurisdictional involvement and who reports to the Incident Commander. Planning by group followed by implementation under the authority of a single individual is an element essential to ICS structure. When an ICS team is called in to suppress a fire, the fire and the team are classified as Type I, Type II, or Type III, with I being least severe and III being most severe. In place of "Type," the words "Level" or "Class" are sometimes used. Most people on the teams work at other jobs when they are not responding to an ICS incident, many, though not all, in the field of firefighting.

Praise for the efficiency and effectiveness of the Incident Command System has led FEMA to explore using the system in permanent organizations that handle routine situations, according to Dave Liebersbach (1993). He emphasized that the needs of an organization are different in routine and non-routine situations, citing minimal span of control as an example of a principle that would not be appropriate for day-to-day operations. He pointed out that ICS can, however, be effective for non-routine events that are not emergencies; ICS handled the Pearl Harbor 50th Anniversary celebration, which lasted six months and ranged in location from Washington, D.C. to Guam.

Insert Figure 1 here.

CONTENT ANALYSIS

We use both quantitative and qualitative content analysis to explore the emotional content of the interview text. According to one definition, "Content analysis is any research technique for making inferences by systematically and objectively identifying specified characteristics within text" (Stone, Dunphy, Smith, and Ogilvie, 1966, p. 5). This definition, if edited to exclude the word "objectively," would apply to qualitative as well as to quantitative content analysis. The inferences we wish to make concern the emotional atmosphere in an effective disaster response effort such as the Pothole Lake Fire. The specified characteristics within the text that we wanted to identify are emotion-related words and concepts. For the quantitative analysis, these characteristics were systematically and objectively identified

through the use of a software program that does word frequency counts. The list of emotion-related words to be searched for was based on Heise's research. For the qualitative analysis, emotion-related concepts were systematically identified by studying the text and extracting relevant passages.

Content analysis may be implicit or explicit. Explicit analysis searches for words or phrases which actually occur in the text, while implicit analysis identifies concepts which occur in the text only by implication (Kang, Wallace, and Carley, 1993). For example, "John loves Mary" contains the explicit emotion "love," while "John beat Steve" implies that Steve and John may be adversaries. Explicit analysis is easier to automate and quantify, but may miss information that is implied rather than stated. We will use both approaches: explicit analysis with word frequency counts and implicit analysis through study of the text.

The main advantages of using computer-aided word frequency counts are speed and the ability to handle large volumes of data. The primary disadvantage of word frequency counts is that they cannot distinguish between homographs, words that are spelled the same but have different meanings when used in different contexts. Some content analysis software packages overcome this problem by using an indexing feature which lists sentences that contain words whose meaning depends on their context (Kang *et al.*, 1993). The researcher then reviews the questionable sentences and makes a decision about them. This kind of program was not used in this research; however, the problem of homographs is addressed later in this paper. Another disadvantage is that the word list is subjective on the part of the researcher. We have attempted to reduce this subjectivity by using an emotion-word list developed by Heise as a result of his research in affect control theory.

In order to conduct a frequency count with the program used in this analysis, two input files are required: a concept list and a text list. The text list is simply a list of text file names to be searched. In this study, each transcribed interview has its own text file. A concept is a single idea that may be represented by a single word or by a phrase concatenated by a "_" symbol. Each concept consists of a base "word," which is a word or phrase that represents a key concept, and discrete "words," which represent synonymous words or phrases equivalent to the base word. For example, the base word or concept "talk_to" is associated with the discrete words "talked_to," "talking_to," and "talks_to." Although the program performs primarily explicit analysis, the analysis also is implicit as a result of the structure of the concept list, which links base concepts with related discrete words. When the program finds one of the discrete words, the base concept to which that word is connected is coded, and thus a concept has been found through implication, rather than through explicit use. The program can handle subtleties of spacing and punctuation and does not match to partial word-strings, thus avoiding inaccurate matches based on embedded words. For example, "fear-monger" would not be identified as an instance of "fear".

The program begins by counting the number of occurrences of concepts in the texts and produces an output file containing all base and discrete words along with their frequency counts. The number beside each discrete word is a frequency count for that word alone,

while the number beside each base word is the sum of all counts for its associated discrete words. Since each base word is also included as one of its discrete words, it is clear how many occurrences of the concept come from the actual base word as well as from the related discrete words. The program then strips from the output file any base or discrete word that did not occur in any of the texts being processed, resulting in a reduced word list and frequency count. Additional output files provide a list of words removed and basic statistical data about the concepts found. The output file "wordf.out" consists of a list of all base and discrete words listed alphabetically along with their respective counts. There is one word for each base word and discrete word and one column for each text file or interview. A final column identifies base words with a "1" and discrete words with a "0". The counts for base words are the sums of the counts of all associated discrete words. The output file wordf.out was used as the basis for further statistical analysis.

Quantitative Analysis

The file wordf.out was reduced to a list of all the base words, each with the total number of times each base word and its related discrete words were used. Heise's evaluation ratings were assigned to each word. There were 275 words in the output file that corresponded exactly to words on Heise's list. Another twenty-five words in the output file were similar enough to words on the Heise list that the ratings for those words were used. Thirteen words in the output file had no match judged close enough on the Heise list and therefore were discarded from the analysis. The evaluation rating for each word was multiplied by the number of times each interviewee used the word. These products were then totalled for each interviewee, providing a raw E-score, and divided by the total word count for each interview to yield an adjusted E-score.

Content analysis as a methodology has a number of data-related problems that must be resolved. The biggest problem in this study is the inability of the software to distinguish between use of words in different contexts. This may include words used as proper names as well as words that have more than one meaning in common usage. An example of the former problem would be picking up the phrase "Incident Command System" as an instance of the word "command." Since "command" has a Heise E-rating of -.32 for males and -.35 for females, frequent use of the phrase "Incident Command System" could negatively skew the results. Fortunately, this turned out not to be a problem, since the interviewees tended to use the abbreviation "ICS" rather than the full name.

The multiple meaning problem arises for common words, such as "like" or "kind," and also for less common words that are used unusually often due to the nature of the environment. Words in the latter category might include "command" (as separate from "Incident Command System"), "control," "direct," and "out." Since this research involves a paramilitary organization engaged in firefighting, these words were expected to occur more frequently than usual and thus had the potential of skewing the E-scores. In fact, the data showed that the words "command," "control," and "direct" did have a fairly high incidence; however, it was not possible from examining the text to state positively that these words had no emotional

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connotation, and therefore they were not removed from the analysis. The word "out" was the most frequently used, with a count of 404, but since Heise had no E-rating for this word, the issue of inclusion was moot.

The words "like" (used 389 times) and "kind" (used 138 times) also created a multiple meaning problem. For both of these words, we examined individual instances in the text to determine the best way to handle them. We found that "like" was used both as a colloquialism ("Like, we ate dinner") and as an emotion-related word ("I like my job"). For this reason, "like" was left in the analysis. "Kind," however, was removed, since nearly all instances of its use were colloquial ("kind of"), clearly not an emotion-related usage. The same problem occurred with the word "mean," which was used 76 times. All uses of this word were in the context of "I mean," rather than in the word's emotional sense. Therefore, "mean" also was removed from the analysis. The interviewer's words were stripped from the texts prior to the running of the content analysis program.

Basic statistics on word frequency usage are displayed in Table 2 and Table 3.

Insert Table 2 here.

Insert Table 3 here.

The words "out" and "want" were two of the thirteen words with no suitable match in Heise's dictionary; therefore, they have no E-rating. Because each adjusted E-score is based on 313 individual word scores, the Central Limit Theorem applies, and the adjusted E-scores can be assumed to be approximately normally distributed.

Table 4 lists the adjusted E-scores for each interviewee. Twenty-six out of the twenty-seven scores are positive, implying an overall presence of positive emotion, which also was the impression we got from studying the text; however, since this was the first project of this sort, we have no previous E-score profiles with which to compare our results. Although Maronbanks had a negative adjusted E-score, his interview does not seem negative in tone. Because we had no similar data from other incidents with which to compare these results, we performed an internal statistical analysis.

We classified each interviewee according to three variables: gender, role, and position. The sub-classes within gender were male and female; the sub-classes within role were resident and staff; and the sub-classes within position were managerial/supervisory and non-managerial/supervisory. Each interviewee was assigned to one subgroup in each of the three classifications. The interview called Marty was removed from this section of the analysis, because there actually were two interviewees, both named Marty, one of whom held a supervisory position and the other of whom did not. Dorothy Todd is a resident who worked in planning support, thus technically placing her in both the staff and resident categories. Reviewing her interview, however, we found that she spoke from the perspective of a resident and therefore put her in that category. Bruce VanZee was in a similar situation; but his interview dealt almost exclusively with his position as Chugach National Forest Manager, and so he was classified as staff. The assignments are listed in Table 1. Statistical Analysis Software was used to test for significant effects of the three classifications. Table 5 lists hypotheses and results.

We tested for main effects of each of the three variables with hypotheses that compared the means of the two sub-groups within each classification variable. We tested also for interaction effects among all three variables. The results indicated a main effect for gender and no main effects for role or position, nor any interaction effects. Testing on role and position alone yielded no main effects. While there was a strong indication of a main effect for gender, our inferences were limited by what the sample represents; six women and 15 men were interviewed. We were doing a retroactive analysis of data, and the interviewees were not picked with this particular kind of analysis in mind. If this research were to be repeated using the same classifications, we recommend selecting an equal number of women and men, using a larger sample size, and choosing a demographic cross-section of participants.

The analysis yielded univariate statistics for each cell as shown in Table 6. The areas for male and female resident managers are blocked out, because only staff held managerial or supervisory positions. The cell for the standard deviation for female staff managers is blocked out because there is only one occupant of that cell, so there is no basis for comparison. Also, main effects could not be compared for that cell, for the same reason.

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Qualitative Analysis

After studying the transcribed interviews, we selected nine broad emotion-related themes for further analysis. The areas, along with the numbers of interviewees who talked about them, are listed in Table 7.

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A feeling of pride, pleasure, and/or excitement about their jobs, or about the Pothole Lake fire, was expressed by twelve interviewees, often in strong terms. Some sample comments include:

Tupper: ". . . best job on the planet."

Anderson: ". . . I've really enjoyed myself . . . it's been an excellent experience for me . . ."

Knowles: "I went to the town meeting here the other night and for me it was a pleasure. It was too bad the firefighters out there can't go to those . . . then the thankyous come along and the firefighters never really get to see that."

Chittendon: "It's gratifying and it's challenging and I like it."

Hasselquist: "You have to pass the PT [physical training] test to even be able to make it on the crew. So there's a lot of pride in that and being really . . . prepared and the standards the crew boss sets make it more organized and more structured. Dave [Jandt] had real high standards."

Hasselquist: "I love it . . . I'm so glad I made this decision . . . it's always an adventure."

Marty: ". . . it's like an adrenaline rush . . . You know and you're out in the fire and it's burning and it's hot, it's going and everybody's pumped up . . ."

Many people expressed a level of enthusiasm approaching zeal about their jobs. Several proudly recounted details of dangerous experiences or demanding training they'd been through. Often, they sound as though they thrive on the physical risks involved. There have always been people who gravitate to professions with an element of danger, people who find risk, physical challenge, and intense experiences invigorating and exciting. Jandt talked about the "surreal" and "quasi-religious" aspects of a certain dangerous situation. He described a "real heightened sense of awareness of the surroundings." It is common knowledge that

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dangerous situations can produce a naturally-occurring "high," as Marty (see above comments) described. For people who enjoy this level of intensity, the heightened awareness it produces (see Jandt above) may enhance their job performance. This could be one reason why this firefighting effort went well: these firefighters clearly love their jobs and are proud of the demanding work they are able to do.

Several people expressed pleasure specifically about the experience of working with others. There is some overlap here with the topic of group cohesion, and these comments express both positive emotions and also pleasure in contact with other people. These comments included:

D. Todd: "These people are really special."
Perry: "I think working interagency is a real rewarding experience."
Stordal: "It's been really nice. They're a really good group of people."

It seems that working together with other people is a major source of positive emotion for both the firefighters and the residents. Robertson talked about how nice it was to work with people that he already knew: "I don't have to go through the mating game with them to know personalities, introduce myself. They know how I think. I know how they think. We can just jump in."

Some people used the metaphor of family:

Marty: " . . . it's like having brothers and sisters, twenty of them in all . . . it's like for
              some reason there's a bonding . . . everybody's unified together . . ."
Hasselquist: "They really are like brothers. They're real special."

Perry talked about the primitive facilities and simple meals and his sense that these hardships enhanced a sense of togetherness. Several people mentioned that the conditions of this fire were more primitive than the conditions of most Lower 48 fires. Hasselquist said,

> "Down south in the Lower 48 it's a lot more clustered and civilized. They have caterers. They have showers . . . Up here . . . we carry our own tents, sleeping bag, MRE's -- we'll eat those for three days and then they usually fly us some fresh food. You do your own cooking. You set up your own camp. You don't have all that other [stuff] . . . and we seem to get a lot more work done."

Group living under primitive conditions is known to build group cohesion; that is the basic premise of the Outward Bound program, a program for adolescents designed to build trust and leadership skills. Group cohesion certainly is an essential part of any firefighting effort, and Hasselquist made a direct connection between the primitive conditions and her sense that somehow, the hardships help them do their jobs better. If this chain of causality holds (primitive conditions contribute to group cohesion, which improves job performance), then this may help explain the high effectiveness of response to this particular fire.

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Other comments relating to group cohesion include:

Hasselquist: " . . . the crew was made to all interweave, you know. And if one person is missing, you really notice it . . . that bonding, you know, cause you're all so interdependent on each other. And it can run real smooth."

Jandt: "Just even after that day [of a dangerous situation] I saw a lot of the camaraderie come together." Jandt went on to say that the lead foreman, in handling this particular situation, acted instinctively as a result of his training and experience, but that he, Jandt, believed that the foreman's actions resulted also from the strong relationship among all of the crew members.

Stordal: "It's been really nice. They're a really good group of people. Real helpful and they're really into doing this. They get excited when fire season comes along, they're, Oh, let's go put out this fire."

On the more general topic of group dynamics, Jandt commented:

"I think if people are happy doing what they're doing, they're going to produce a lot of good work. And, I think as a supervisor, to be able to anticipate the feelings the reactions, the developments that go on within a crew is necessary."

Several people talked about how good they felt to be helping other people or the land:

Stordal: "I'm glad we were able to do something. Do our part in saving the park."

Barnet: ". . . it's a beautiful area and I'm glad we were able to help them save some of the resources that were here, that were at risk."

Hasselquist: "I'm not just here as a tourist. I'm here to protect a village."

People often derive emotional satisfaction from being of service to others. Many professions offer different degrees of opportunities to be of assistance to people, places, or animals. Firefighters help in one of the most fundamental ways possible: they save lives, homes, and land. Their well-justified pride in their profession may lead to a commitment to doing the best job possible.

Liebersbach expressed an attentiveness to the needs of the town:

". . . the success may have to be measured in something other than just putting out the fire . . . . it is threatening the community but at the same time, probably as important to them is that we don't damage he community with the people we have . . . or equipment, our vehicles speeding through the town trying to get to the fire runs . . . that's a pretty serious situation and probably much more serious than the fire itself."

". . . part of our objectives . . . were to get this done with minimum impact on the town, which we did . . . the last stage of any rescue is to shoot the rescuer and basically this fire is done here and the biggest concern I have right now is not the fire but it's the impact on the

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community of Cooper Landing and we're trying to get ourselves out of here. . . we need to be out of the way [for the upcoming tourist season]."

One of ICS's operational priorities is to avoid disruption to communities and to be attentive to local needs. As Incident Commander, Liebersbach was responsible for the overall operation, and his emphasis on this aspect illustrates the use of ICS principles in the field. The non-disruption policy probably contributed strongly to acceptance of and cooperation with ICS by local residents. These people already were threatened by the intrusion of the fire into their lives; any organization that wants to be successful not only in fighting the fire, but also in helping to alleviate the distress of the people needs to attend to human needs as well as to firefighting needs.

Such dedication and enthusiasm are not possible without strong support from the sponsoring organization. Four interviewees mentioned their sense of feeling taken care of by ICS in general, and by their colleagues and supervisors in particular. Some comments in this area include:

Klein:	"They've taken good care of us out here."
Perry:	". . . the overhead team person . . . cannot forget the needs of the firefighter . . . you don't ask anything of your subordinates that you would not do yourself. And I think that's pretty good management philosophy and I do that not only on fires but I also do that in my everyday job."
Jandt:	". . . our niche in this organization is to go out and do the hands-on work . . . somebody has food here for us. Somebody has water. Somebody . . . tells us where to camp. Somebody picks up our garbage."
Hasselquist:	"Well we have really good bosses. They knew what was going on. They kept people from panicking. . . [The crew boss] gave everyone that night to just think about it and the next day he talked to us about [the close call]."

These comments demonstrate different kinds of "taking care of" that go on within ICS. Perry, speaking as a Resource Unit Leader, was well aware of his responsibility to the people he commanded. Jandt was saying that because logistics were taken care of, the firefighters were able to concentrate on their jobs. Although he was a division supervisor, he was referring not to how he took care of his people, but to how the ICS organization took care of everyone by clearly identifying scopes of responsibility and making sure that all important tasks are assigned to someone. Hasselquist was referring to her personal experience with an unusually dangerous situation; her comment illustrates that caretaking occurs on an emotional level as well, and that supervisors were aware of and concerned about people's feelings.

In addition to the feeling of being properly cared for, another element essential to a disaster relief effort is good communications. No fewer than seven interviewees discussed this topic, albeit often in response to a communications-related question from the interviewer.

Liebersbach: " . . . before we even got here, they already had a town meeting . . . going so

	that we could meet with the town people, disseminate information to them about what was occurring, receive from them their concerns, their worries and whatnot so information was going on."
Phil Todd:	"They did an excellent job . . . in keeping the community informed . . . They made an excellent effort at doing that. Even though there wasn't a lot of people that went to all the meetings, there was people that did go that then spread the word to the community . . . and to me it was a comforting thing every night to go over and to listen to their updates. It only took twenty minutes or so, but to me it was a very comforting thing."
Painter:	"They had meetings at the school every night . . . You could come and ask them questions any time, which I did and . . . somebody was always glad to talk to you and they . . . had several phone lines put in [our library] and published phone numbers in the newspapers so people could call in at any time."
Ground:	" . . . they did a very good job of keeping us [informed] where the fire was, where they were working, what they were trying to do, when they would get it under control, when they would get it contained . . . "
Hasselquist:	"Back to the communications thing and this whole organization, I think this fire's really been pretty well organized and communicated."

Other interviewees who discussed communication were Dave Jandt and Lindsey Lien. Lien talked about his job as communications director and Jandt emphasized the importance of good communication, "especially when there's a long chain of command." Liebersbach's comments illuminate an important but sometimes ignored facet of the process: good communications require effort on both sides. The people of Cooper Landing took an active part in receiving their information; they already had a process in place when the ICS Class I team arrived. This allowed the ICS people to concentrate on collecting and disseminating the information, rather than on setting up the meetings. The comments of Todd, Painter, and Ground gave the residents' perspective on communications; clearly, they were very pleased. Painter talked about the accessibility of information, and Phil Todd spoke about the emotional importance of being informed. Ground's comment shows that ICS was able to clearly communicate technical firefighting information to lay people, a task that can be difficult in the midst of turmoil and upset.

One of the ways that ICS takes care of its staff is by offering high-quality training. Jandt commented that ". . . [this has been a] real good fire in terms of training." His crew had been well-trained, and he saw the benefit of that training during the Pothole Lake Fire. Hasselquist, who was in Jandt's crew, said, "This is like special training and I think there's only like two crews in the country that are getting extra, extra special fire training. And we are one." Hasselquist's pleasure in the training also contains a good measure of pride.

Perry talked about his work as a learning experience, rather than about specific training:

> ". . . it's good because you teach and you learn at the same time and I bring some of my experiences from the Lower 48 to Alaska and I intend on taking

some of their management principles back to the Lower 48 when I go."

Chittendon, Logistics Section Chief commented that,

> "If you have the staffing and they're experienced, it should run as smooth as
> possible, you know. Like I said, you're always going to have snafus and stuff
> like that but uh, the organization's there." Chittendon relies on experience and
> ICS training and structure to navigate the unpredictabilities of fire suppression.

Such highly stressful work performed with such pride inevitably leads to a certain amount of
competition and even a sense of elitism. Tupper, a Smoke Jumper, compared his group to the
Hotshots (the group to which Hasselquist belonged): "It's easier to handle Hotshots than it is
to handle Smoke Jumpers. . ." He was proud of the relative independence of his group,
which was ". . . unlike the Hotshot crews . . . [who] have definitive leaders who are one
guy's in charge period."

Amatin, a local firefighter, seemed to be speaking for his colleagues when he said, " . . . once
in a while they always say Hotshot crews are better than us, but once in a while I don't think
so . . . they go to training for it but it seems like they've been training all their lives. " There
was a sense of envy here, perhaps for the professional development that is provided by ICS,
as well as the feeling that "they've been training, but we've been *doing*."

An article in **The Anchorage Daily News** stated, "Idle firefighters here grumbled last week at
the news that 80 of their competitors from Outside were hired to help put out the Pothole Fire
on the Kenai Peninsula," (Spencer, 1991). The fire "fueled a short-term mini-economic boom
in Cooper Landing . . . About $45,000 has gone for local firefighters' wages and fire
department equipment," (Ellis, 1991). It is understandable that local firefighters not called in
would resent the work being given to outsiders. Given the threat of the fire behavior, the
Type II Incident Commander, Ed Edmondson, made the decision to bring in additional
specially trained Type I crews. Alaska has only two Type I crews, and both of these already
were working on the Pothole Lake fire. Feelings over the locals' being left out seemed not,
however, to impinge negatively on the general perception of how the fire was handled.
Liebersbach, the Type III Incident Commander, certainly was sensitive to local issues and did
not want to repeat mistakes make in other disaster response situations: "The overlooked
incident . . . in Valdez was the impact on town and the people there . . . they made a lot of
money, but their whole town was taken away from them by the responders to the incident."

Another theme that emerged from the interviews was that this fire was beneficial to the
forest.

Wells: "I think it's a very beneficial fire . . . when the forest gets to the point that it is
so old and so thick and tangled and everything, something has to be done
because when it gets that bad, there's nothing that can live there. I mean there's
a few birds, but even most of the birds prefer a younger forest that's not quite

so thick. They enjoy the heavy cover to protect them from their predators and stuff and when it gets real thick it gets too hard for even them to get around in. So fire is good in some circumstances . . . that can be controlled."

Doshier, the Manager of the Kenai National Wildlife Refuge, explained,

"We use fire as a management tool . . . from a resource standpoint, it was doing good things. It's taking out the old, mature, dead forest, and, you know, new growth is more beneficial. It's more nutritious, and it's better for wildlife. You need the variety. You don't need all of one kind of forest. So breaking it up with burned area is good . . . There's no doubt about it. It's been good . . . it's a good fire from a wildlife standpoint. The bottom line is fire for the Refuge is good."

VanZee, Manager of the Chugach National Forest, had much the same perspective:

". . . fire is a natural process and the burn such as they have will be of benefit to the Refuge. It'll increase sprouts, especially for moose and some other things. It helps in revegetating the land as you can see by the amount of dead timber around here. That's desirable . . . [to] try and get a mosaic of age classes beneficial to wildlife, grazing and watershed and for wildfire protection."

The fire's beneficial aspects were touted in several newspaper articles as well. The Anchorage Daily Press and the **Anchorage Times** quoted Doshier and others explaining the ways in which fire is necessary for the ongoing health of wildlife. One article (Phillips, 1991b) talked about the expected blossoming of the moose population as a result of this fire. The 1991 population in the Pothole Lake burn area, about two moose per square mile, is expected to increase significantly by the year 2000. The ICS team used the media to project a positive image. Wells, in his interview, mentioned the benefits to moose, a sign that the media were successful in reaching people and influencing their perceptions about this incident.

One of the most prevalent themes throughout the interviews was praise for how ICS was managing the fire. Sample comments included:

Phil Todd: "They did an excellent job. Both professionally in getting the fire out, but also in keeping the community informed. . . "
Painter: "I think they were great."
Perry: "I think the management of this fire . . . has been real, real good. If you get into the ICS system and become familiar with it, I think that you'll find that the way a fire is handled is basically the same . . . I think the management of this fire has gone real well. I think there's been some wise decisions made." Perry, a resource unit leader, also talked about the importance of including local teams in the firefighting effort, since they know the land and the local people — another example of ICS's sensitivity not only to local needs, but also to the

unique contribution that local residents and professionals can make.

Klein, a crew boss of an Alaskan crew, talked about how well the ICS hierarchy works, in terms of the emphasis on manageable span of control:

> "You know each squad boss and if they're there, then their squad is there . . . When we're in a position where we have to do something quickly or something like that I only have to control two, three people. And they control three to five people. . . it's a great system, I think."

Ground: "I think they did an excellent job . . . they did an excellent job of building the fire breaks to keep it from getting in there."

Chittendon: "I think this team's probably one of the best in the country."

Doshier: ". . . the decisions were made based on the best available information at the time. I think were good ones, were legitimate." Here, Doshier, the Kenai National Wildlife Refuge Manager, appears to be defending the early decision to let the fire burn.

D. Todd: "My experience with this group . . . it's like it's supposed to be. . . it's very pleasant and very professional." ICS clearly met Ms. Todd's expectations of a disaster response organization.

VanZee: "The interagency cooperation was very good. The Incident Command System . . . worked very, very well. That part went better than I expected." ICS exceeded the expectations of VanZee.

Liebersbach: "Well we use the Incident Command System in all our wildfire response . . . it's fit real well. We're organized to deal with fires . . . using that system and the people who were running the fire before us were using it so that made the transition very smooth coming in . . . " When not working on an incident with ICS, Liebersbach works for the Bureau of Land Management in Fairbanks.

This praise for the ICS system and for the firefighting efforts at Pothole Lake, comes from both residents and firefighting staff. The staff tended to speak highly of the system as a whole, while residents focused on the one experience they had with ICS -- this fire. The staff's respect for the system within which they work is likely to enhance their loyalty to that system, and consequently improve their job performance.

EVALUATION OF THE POTHOLE LAKE FIRE

The fire was formally evaluated internally by the Incident Command System and externally by the Alaska Fire Service, the agency which called in the Incident Command team. The interviewees informally evaluated ICS's performance by commenting on it in their interviews; these comments are discussed in the Qualitative Analysis of the interview text.

The Fire Overhead Performance Rating is the ICS internal evaluation. The performance ratings for Dave Liebersbach, in his role as Incident Commander, are listed in Table 8.

The rating numbers have the following meanings:

0	Deficient. Does not meet minimum requirements of the individual element.
1	Needs to Improve. Meets some or most of the requirements of the individual element.
2	Satisfactory. Employee meets all requirements of the individual element.
3	Superior. Employee consistently exceeds the performance requirements.

The rating of "2" under Consideration for Personnel Welfare, is explained by attached comments suggesting that the Logistics Section "could have considered in this roadside fire situation catering of meals to crews and overhead," (Fire Overhead Performance Rating, 1991) and also suggesting the use of suppression action showers for personal hygiene.

All other comments are complimentary to the highest degree. Liebersbach and the team were especially commended for their attention to safety, their handling of the media, and their successful efforts at community relations:

> "It's important to note the excellent safety record of the incident. Considering the [hazardous environment], potentially very dangerous to personnel, the safety awareness level emphasis paid high dividends. . . Excellent attention was given to the media demands of the incident by the team. They build upon an established public information program already in place. Their understanding of the political aspects of a highly visible wildfire were well-substantiated . . . Community relations were excellent due to an organized effort by the team to leave the incident, local residents and facilities in better shape than they found them."

These comments confirm the impression given by newspaper articles and interviews that attentiveness by the team to local needs, attentiveness by ICS to the needs of the staff, and emphasis on communications all contributed to the success of this incident.

CONCLUSIONS

A variety of factors contributed to the success of the disaster response effort at the Pothole Lake Fire, including luck, use of the Incident Command System, the nature of the disaster, and the cooperation of the town of Cooper Landing and local agencies.

In his interview, Liebersbach referred to this incident as an "easy" fire. He reported that by the time his team had arrived, the fire was "not overly dynamic" and "was laying down." In

other words, the fire had already taken a turn for the better by the time the team arrived. The weather also cooperated: temperatures, winds, and humidity provided favorable firefighting conditions. Since there were no other incidents in the region at that time, the team working on the Kenai Peninsula did not have to compete for emergency resources.

The interviews, newspaper articles, and internal evaluation clearly identify the role of the Incident Command System in this success story. The emphasis on safety was cited in the evaluation. The general sense that people had of being taken care of by ICS as well as their respect for the system helped to promote the positive emotions of group cohesion, pride in their jobs, and pleasure in helping others. It is likely that these positive emotions enhance job performance; this is a question that needs to be addressed in future research. The positive relationship that ICS had with the town of Cooper Landing can be traced to ICS policies on communications, on unified command structure, and on minimizing disruption to the area in which an incident occurs. Carley and Harrald (1993) found that senior management presence is needed at a disaster site in order to shape media attitudes in a positive way, resulting in a more positive perception of disaster response by the general population. Liebersbach and his section leaders appear to have played this key role. Media coverage and the interviews both demonstrate that ICS not only effectively communicated technical information, but also helped to ease people's fears and to comfort them. Another area for future research is to compare the effects of communicating technical information with the effects of comforting people; what are the relative contributions of these two activities to a town's perceptions of a disaster relief team?

Disaster plans sometimes are not followed " . . . because the planners were not the practitioners. The practitioners had no ownership of the plan . . . " (Carley and Harrald, 1993, p. 12-13). ICS policy addresses this issue in its requirement of a unified command structure, particularly in multi-jurisdictional incidents. Since key officials from involved agencies and jurisdictions participate in setting objectives for the incident, a feeling of commitment to the success of the plan flows back to the general public. Another ICS policy that appeared to play a large role in the success of this incident is the instruction to cause the least possible disruption to existing systems. This instruction seemed to have a significant presence in Liebersbach's mind; he spoke extensively about it in his interview and interpreted it broadly. He talked about being out of the way when the tourist season started and about leaving the area cleaner than it had been when his team arrived. This ICS team seemed almost to consider themselves as guests in Cooper Landing. Their careful and considerate attitude were important factors in the success of their firefighting operation.

Carley and Harrald (1993) have commented on the differences between hierarchical organizations that rely on standard operating procedure and teams of personnel who are allowed to act primarily on the basis of their own experience. They found that the advantages of the former type of organization include some emotional protection from the stress of traumatic situations and greater resilience over the long term. These results appear to be borne out by the functioning of the Incident Command System. Although some of the members of this Class I team had worked together before, many had not. ICS's carefully

defined detailed descriptions of each role needed in a fire incident allows a team of people who have not had previous contact to work together effectively and to communicate clearly. "Within hierarchies learning becomes embedded not only in personnel but in the relationships among personnel . . " (Carley and Harrald, 1993, p. 19).

The Pothole Lake Fire was not catastrophic; no homes or lives were lost. The fire was experienced as beneficial to the environment, although this perception was due in large part to ICS's expert handling of public relations. Wildfires are not one-of-a-kind disasters; they occur regularly, and therefore emergency managers are willing to plan extensively and allocate adequate resources for them. The teams that respond to them have ample opportunity to test their organizational and firefighting skills in real-life emergencies, rather than only in training.

Finally, credit for the success of this incident goes to the town of Cooper Landing and to local agencies. Liebersbach commented in his interview that the town had already arranged meetings through which the ICS team could convey information, and he praised the work of the planning group for the unified command structure. Town residents also volunteered for various support jobs within ICS.

Because the sample in this case study is so small, we are more confident in the qualitative analysis results than in the quantitative analysis results, although the methodology itself is sound. Due to sample size, the main effect found for gender is not statistically significant. We would have expected role to be significant, but it wasn't. It is difficult to say whether the results regarding role and gender are artifacts of the sample size. These questions should be investigated further. It is worth noting that the effort involved in performing the quantitative analysis is virtually the same regardless of sample size. It would behoove future investigators to substantially increase the sample size in order to get statistically significant results from the quantitative analysis.

It is clear from the preponderance of positive adjusted E-scores that an overall tone of positive feeling surrounded this incident, whose success was independently corroborated by the Fire Overhead Performance Rating. This case study suggests that there is a link between the quality of a disaster response effort and the emotional content of interviewees' speech. The methodology (videotaping and transcribing interviews, coding the text, and analyzing the text quantitatively and qualitatively) is thorough and provides a variety of types of results to compare. We recommend using this methodology whenever possible in case studies researching emotion present during crises.

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Table 1 - Interviewees

Name	Description	Gender	Role	Position
Roger Amato	Firefighter	M	Staff	NOT
Terry Anderson	Information, Incident Commander Level 3	M	Staff	MGR/SUP
Albert Smith	Firefighter	M	Staff	NOT
Jim Barnett	Resource Unit Leader	M	Staff	MGR/SUP
Lyle Chittendon	Logistics Section Chief	M	Staff	MGR/SUP
Dan Doshier	Kenai Refuge Manager	M	Staff	MGR/SUP
Dorothy Todd	Planning support, resident	F	Resident	NOT
Pat Ground	Cooper Landing resident	F	Resident	NOT
Darla Hasselquist	Firefighter	F	Staff	NOT
Dave Jandt	Division superintendent	M	Staff	MGR/SUP
John Smith	Incident Command support	M	Staff	NOT
Dennis Klein	Crew boss	M	Staff	MGR/SUP
Ron Knowles	Finance Section Chief	M	Staff	MGR/SUP
Jake Lenarik	Cooper Landing resident	M	Resident	NOT
Dave Liebersbach	Incident Commander Level 1	M	Staff	MGR/SUP
Lindsey Lien	Communications Unit Leader	M	Staff	MGR/SUP
Nancy Luebbert	Demobilization Unit Leader	F	Staff	MGR/SUP
Neil Maronbanks	Meteorologist	M	Staff	NOT
Marty and Marty (two)	Foreman/Sawyer	M	Staff	NOT
Mona Painter	Cooper Landing resident	F	Resident	NOT
Butch Perry	Resource Unit Leader	M	Staff	MGR/SUP
Phil Todd	Cooper Landing resident	M	Resident	NOT
Marvin Robertson	Planning Section Chief	M	Staff	MGR/SUP
Crystal Stordal	Firefighter	F	Staff	NOT
Mike Tupper	Smokejumper/demobilization	M	Staff	NOT
Bruce VanZee	Chugach National Forest Manager	M	Staff	MGR/SUP
George Wells	Command Post Registration	M	Staff	NOT

Table 2 - Word Usage Statistics

Total number of base and discrete words used	910
Number of base words used	313
Number of words with exact matches to Heise's list	275
Number of words where ratings for similar Heise words were used	25
Number of words with no Heise word similar enough to use	13

Table 3 - Most Frequently Used Words

Ten most frequently used words and their counts:			Heise E-rating:	
			M	F
1	out	404	-----	-----
2	like	389	2.24	2.48
3	work	308	0.07	0.99
4	good	220	2.48	2.66
5	want	141	-----	-----
6	kind	138	[removed]	[removed]
7	need	125	1.38	1.70
8	mean	76	[removed]	[removed]
9	train	70	1.24	1.14
10	help	67	2.17	2.34

Table 4 - Emotion Scores

Name	Raw Score	Word Count	Adj. E-score
Roger Amatin	66.07	2520	2.62
Terry Anderson	63.2	1276	4.95
Albert Smith	17.95	846	2.12
Jim Barnett	133.64	2968	4.50
Lyle Chittendon	186.82	5572	3.35
Dan Doshier	50.56	2328	2.17
Dorothy Todd	303.15	8408	5.13
Pat Ground	5.08	219	3.76
Darla Hasselquist	48.34	1206	5.57
Dave Jandt	100.4	4154	3.61
John Smith	11.77	399	2.32
Dennis Klein	168.26	5172	4.01
Ron Knowles	20.26	1239	2.42
Jake Lenarik	-9.98	491	2.95
Dave Liebersbach	185.48	2736	3.25
Lindsey Lien	43.8	1987	1.64
Nancy Luebbert	34.41	2700	4.60
Neil Maronbanks	15.95	656	-2.03
Marty and Marty (two)	97.57	3476	6.78
Mona Painter	46.52	2508	3.17
Butch Perry	50.46	1185	2.20
Phil Todd	47.72	930	1.27
Marvin Robertson	37.59	1001	2.16
Crystal Stordal	392.48	7051	6.35
Mike Tupper	95.53	2078	2.43
Bruce VanZee	93.4	2951	1.85
George Wells	118.98	1874	4.26

Table 5 - Hypotheses and Results

VARIABLE	D.F.	F-VALUE	P-VALUE
Gender			
H_o: $\mu_f = \mu_m$ H_a: $\mu_f \neq \mu_m$	1	7.47	.0128
Role			
H_o: $\mu_s = \mu_r$ H_a: $\mu_s \neq \mu_r$	1	1.09	.3091
Position			
H_o: $\mu_{ms} = \mu_{nms}$ H_a: $\mu_{ms} \neq \mu_{nms}$	1	0.03	.8707
μ_f = Mean adjusted E-score for females			
μ_m = Mean adjusted E-score for males			
μ_s = Mean adjusted E-score for staff			
μ_r = Mean adjusted E-score for residents			
μ_{ms} = Mean adjusted E-score for mgrl/sup staff			
μ_{nms} = Mean adjusted E-score for non-mgrl/sup staff			

Table 6 - Univariate Statistics by Cell

Gender	Role	Position	N	Mean	StdDev	Min	Max
Male	Resident	Not Managerial	2	2.11	1.19	1.27	2.95
		Managerial	0	----	----	----	----
	Staff	Not Managerial	6	1.95	2.10	-2.03	4.26
		Managerial	12	3.01	1.09	1.64	4.95
Female	Resident	Not Managerial	3	4.02	1.01	3.17	5.13
		Managerial	0	----	----	----	----
	Staff	Not Managerial	2	5.96	.551	5.57	6.35
		Managerial	1	4.60	----	4.60	4.60

Table 7 - Emotion-Related Themes

Theme	#
Pride/pleasure/excitement about their work or about this fire	12
Praise for ICS's firefighting efforts	11
Good communications, the importance of communications	7
Sense of family, group cohesion, group dynamics	5
Feeling of being taken care of by the ICS organization	4
Importance of good training, firefighting as a learning experience	4
Altruism, sense of protectiveness toward the region or town	3
The Pothole Lake fire as beneficial	3
Sense of competition, elitism	2

Table 8 - Fire Overhead Performance Rating

Rating Factors:	Rating:
Knowledge of the job	3
Attention to Fire Fundamentals	3
Ability to Obtain Performance	3
Practice Race and Sex Equality	3
Attitude	3
Initiative	3
Consideration for Personnel Welfare	2
Obtain Necessary Equipment and Supplies	3
Physical Ability for the Job	3
Safety	3
Summary	3

INCIDENT COMMAND SYSTEM

INCIDENT COMMAND
- INFORMATION
- SAFETY
- LIAISON

OPERATIONS SECTION
- STAGING AREAS
- BRANCHES
  - DIVISIONS AND GROUPS
    - SINGLE RESOURCES
    - TASK FORCES
    - STRIKE TEAMS
- AIR OPERATIONS BRANCH
  - AIR ATTACK GROUP
    - HELICOPTER COORDINATION
    - AIR TANKER COORDINATOR
  - AIR SUPPORT GROUP
    - HELIBASES
    - HELISPOTS
    - FIXED WING BASES (COOR.)

PLANNING SECTION
- RESOURCES UNIT
- SITUATION UNIT
- DOCUMENTATION UNIT
- DEMOBILIZATION UNIT
- TECHNICAL SPECIALISTS

LOGISTICS SECTION
- SERVICE BRANCH
  - COMMUNICATIONS UNIT
  - MEDICAL UNIT
  - FOOD UNIT
- SUPPORT BRANCH
  - SUPPLY UNIT
  - FACILITIES UNIT
  - GROUND SUPPORT UNIT

FINANCE SECTION
- TIME UNIT
- PROCUREMENT UNIT
- COMPENSATION/CLAIMS UNIT
- COST UNIT

(5-1 reporting ratio for Resources to Branches Divisions/Groups)

Figure 1 - ICS Hierarchy
Adapted from The Incident Command System and Structural Firefighting, National Fire Academy, 1983