

March 2, 2005

MEMORANDUM TO: Paul H. Lohaus, Director  
Office of State and Tribal Programs

FROM: Shawn Rochelle Smith, Health Physicist */RA/*  
Office of State and Tribal Programs

SUBJECT: MEETING WITH THE GALENA, ALASKA CITY MANAGER  
TO DISCUSS THE REACTOR LICENSING PROCESS

On February 2, 2005, the United States Nuclear Regulatory Commission (NRC) staff met with the Galena, Alaska City Manager, Marvin Yoder, and Vice Mayor, Lewis 'Tom' Johnson, to discuss and answer questions on NRC's reactor licensing process. Attachment 1 lists the meeting participants.

A public meeting notice was issued on January 26, 2005, and was posted on NRC's public web site (ADAMS Accession Number ML050250395). Discussions included (1) background, overview, and status of 4S project in Galena, by Marvin Yoder, (2) overview of NRC organization, by the Office of State and Tribal Programs (STP), ADAMS Accession Number ML050540708, and (3) overview of NRC's licensing process, by the Offices of Nuclear Reactor Regulation (NRR), Nuclear Regulatory Research (RES), and Nuclear Security and Incident Response (NSIR). Attachment 2 contains the agenda. The meeting was facilitated by Paul H. Lohaus, Director, STP. Shawn Rochelle Smith, STP, was the meeting contact and is the central point of contact for the City of Galena and meeting participants.

#### Background and Status of 4S Project in Galena

Marvin Yoder provided opening remarks expressing his gratitude for the opportunity to meet with NRC and the coordination that had been made with regard to the meeting. Mr. Yoder provided information on the background, history, and status of the 4S Project in Galena. Galena is an isolated, remote village located on the Yukon River in Alaska, with a population of about 700. There are no roads in or out of Galena. Transportation in or out of Galena is either by barge or airplane. In the winter months, when the river is frozen, the only transportation in or out of Galena is by air. The City operates six diesel generators, as the main power source with an average consumption of 700,000 gallons of diesel fuel used per year. Fuel is brought in during the summer by barge.

Since becoming City Manager in 1996, Mr. Yoder has been examining ways to lower the cost of power in Galena. He has examined various options, including coal bed methane, solar, and coal. However, for a variety of reasons, (e.g., distance to the city), the options appear non-viable. In May 2003, Mr. Yoder was informed of the 4S ("Super Safe, Small, and Simple", as referred to by the designer) reactor, a liquid sodium cooled reactor design developed in Japan. He was then put in touch with representatives from Shaw Pittman and Toshiba, and a meeting was held in Galena to discuss the reactor. After the meeting, the Anchorage Daily News ran an article on the potential siting of the 4S Reactor in Galena.

Mr. Yoder subsequently held meetings with City officials and Toshiba, and multiple public meetings were held, to obtain more information on the reactor. A report on energy alternatives for Galena was prepared, under the sponsorship of the U.S. Department of Energy's (DOE) Arctic Energy Office, by a collaborative group, comprised of representatives from Science Applications International Corporation (SAIC), University of Alaska-Anchorage, Idaho National Engineering and Environmental Laboratory, and the University of Alaska-Fairbanks. The draft final report concluded that the nuclear option was the most economical and favorable option, if certain conditions were met, followed by coal. The report is currently being reviewed by the DOE, and is not yet final. Mr. Yoder concluded his remarks by: (1) extending an invitation to NRC to visit Galena; (2) noting that the City is in the process of seeking funding for a series of "white papers" to analyze regulatory issues specific to the 4S Reactor, such as safety and security; and (3) indicating the City's intent to explore obtaining an early site permit.

Lewis 'Tom' Johnson, the Vice Mayor of Galena, also in attendance at the meeting, noted that an informal survey had been conducted to examine the cost of living in cities in Alaska. The result of the survey was that Galena had the highest cost of living for a city of its size. He also provided that the city is looking at the possibility of hydrogen production and/or the development of distribution systems for the surrounding cities.

#### Overview of NRC's Licensing Process

Joseph Williams, NRR, Stuart Rubin, RES, and Scott Morris, NSIR, provided an overview of NRC's licensing process. Mr. Williams' presentation (ADAMS Accession Number ML050540711) covered NRR's role in the licensing process. He discussed NRC's strategic goal of openness, which includes providing accurate and timely information to the public, and opportunities for public involvement. He noted that there are two licensing process paths: (1) Title 10 of the Code of Federal Regulations, Part 50 (10 CFR Part 50), used to license the current generation of nuclear power plants, and (2) 10 CFR Part 52, which reflects the lessons learned from licensing current plants. Part 50 employs a conventional two-step licensing process, and requires an application for a construction permit followed by a second application for an operating license after plant construction is complete. The Part 52 approach applies to submission of a single application for a combined construction permit and operating license (COL). 10 CFR Part 52 also provides the option of referencing an early site permit (ESP) in the application for a combined license. Either process can be used to license future power plants. Additional information on the processes can be found in the Standard Review Plan, which can be assessed on the NRC web site. As a part of NRC's review, there are a number of inspections conducted. For example, if the City of Galena proceeds to seek a license for the 4S Reactor, NRC inspectors would be onsite during construction at the site in Galena, and during fabrication of the reactor at the manufacturing location.

NRC is currently reviewing the first three applications for ESPs. Those sites include North Anna, Grand Gulf, and Clinton, all of which currently have existing reactors. Mr. Johnson asked what components the NRC review includes. Mr. Williams replied that NRC reviews all nuclear related items and ensures that all non-nuclear items cannot negatively affect nuclear components. Mr. Johnson also asked whether an ESP could be pursued without a design certification, and Mr. Williams replied yes.

Mr. Yoder was informed of NRC's fee system rules and that NRC staff hours for the review are billed to the applicant. (10 CFR Parts 170 and 171 have additional information on fees.) There are some exceptions for small reactors. NRC has no cost estimate for review of the 4S Reactor and there are currently no operating reactors of the same type to use for comparison. However, the cost would be millions of dollars. Mr. Williams encouraged the Galena representatives to communicate in writing with NRC as to its potential path forward and likely schedule, which would help NRC with case load forecasting and budgeting of resources for the reviews. Mr. Williams also encouraged the City to review the ESP applications currently under review.

Mr. Rubin provided an overview (ADAMS Accession Number ML050540712) of RES's role in the licensing process. RES supports NRR in reviewing new plant license applications and serves as the NRC lead in pre-application reviews of new non-light water reactors, such as the 4S Reactor. RES supports NRR in various aspects of the licensing review, such as conducting confirmatory safety analyses, performing confirmatory testing, and evaluating safety margins and uncertainties. The objectives of the pre-application review are to familiarize NRC with the design and technology of the reactor, provide feedback to the pre-applicant on its development plans, and provide input to NRC infrastructure needs. The pre-application review also provides feedback to the pre-applicant on technology, design, and licensing issues, such as reactor and plant analysis, structural design requirements, probabilistic risk assessment, and fuel performance analysis and qualification. Mr. Rubin concluded with a re-emphasis on planning, which is the first part of a pre-application review.

Mr. Morris provided an overview of NSIR's role in the licensing process. NSIR conducts detailed security reviews in accordance with 10 CFR Part 73, in which various aspects are reviewed, such as personnel access authorization, training and qualifications for security officers, and physical security plans. Potential adversary pathways are also reviewed. Applicants for reactor licenses must design their site protection strategies to ensure that they are capable of thwarting the design basis threat, which is prescribed in the regulations. Mr. Morris encouraged the City of Galena to review a recently issued draft safety evaluation report from one of the ESP applicants. He also encouraged the representative from Galena, in discussions with the designer of the 4S Reactor, to look at how the 4S system would be protected. Mr. Johnson asked if NSIR would be interested in reviewing a white paper on security, and Mr. Morris replied yes. NSIR also reviews emergency planning aspects of a proposed new power plant.

Laura Dudes, NRR, re-emphasized the need to plan on the part of the potential applicant/licensee. Planning helps focus discussions on the licensing review process and provides a mechanism for early review, both by putting the potential licensing of the 4S Reactor in process and maintaining NRC's strategic goal of openness. Alan Levin, RES, explained that issues of NRC policy that may arise during the licensing process would be raised to NRC's five member Commission for consideration and decisions.

#### Public Participation

Robert Rosenfeld, Yukon River Inter-Tribal Watershed Council (YRITWC), stated that the YRITWC represented a consortium of Tribal governments along the Yukon River. One of the main concerns of the YRITWC is to keep the Yukon River clean. Mr. Rosenfeld stated that the Yukon River Watershed is the third largest watershed in the U.S., and the cleanest of its size. In addition, Mr. Rosenfeld provided that 76 Tribal communities depend on the watershed for

survival, 62 of which are in Alaska. He stated that he had an upcoming meeting with NRC staff to discuss how NRC planned to adhere to existing Executive Orders that deal with Tribal governments. He also stated that many Tribal governments had expressed concerns with the 4S Reactor, and looks forward to the results of the additional research. In addition, he requested that the YRITWC be kept informed of activities related to the 4S Reactor.

Paul Gunter, Nuclear Resource and Information Service, asked how RES plans to approach the 4S, given the unique characteristics of the 4S. Mr. Rubin replied that RES had only taken a brief look at the 4S and that once an application or pre-application came to NRC for review, RES would look to identify issues relative to the design to ensure safety in its approach.

Steve Mirsky, SAIC, stated that there have been no liquid sodium reactor designs since the 1960s. With little to no expertise of the technology in the U.S., and at the national laboratories, Mr. Mirsky asked how RES planned to resolve issues relative to the 4S. Dr. Levin replied that the NRC had conducted reviews of liquid sodium-cooled reactors in the 1980s and 1990s, including the Clinch River Breeder Reactor, and the PRISM and SAFR designs. Although there are some gaps in expertise, there is still a fair amount of technical expertise; there are databases that contain information on the technology that NRC has access to; and, there is experience with international partners.

Christopher Lapp, Lapp Consulting, asked how NSIR planned to look at emergency planning, and if Galena would have to build shelters given its limited transportation capability. Mr. Morris replied that there may be some exceptions given a reactor of this size, i.e., the 10-mile emergency planning zone might not apply. However, NSIR would review emergency planning as a part of the licensing process.

Dorothy Shockley, Office of State Senator Albert Kookesh, asked how many reactors there were in the U.S. and if the 4S design is the first of its kind, with its potential remote location, that would be licensed by NRC. Mr. Morris replied that there are currently about 65 sites and 103 operating reactors. The unique design of the 4S would be the first of its kind. Mr. Johnson replied that although the 4S is the first of its kind, there is good potential for the 4S in other small communities.

Peter Demoski, Nulato Tribal Council, asked how communities surrounding Galena would benefit from the 4S Reactor. Mr. Yoder replied that the 4S Reactor would operate at a generation capacity of 10MW, which exceeds the needs of Galena. There is the possibility of developing power distribution lines to supply electricity to surrounding communities, and use of the excess power to manufacture hydrogen. Mr. Demoski stated that he planned to send a letter, addressed to Ms. Smith, outlining other questions that he had regarding the 4S Reactor.

Shawna Larson, Alaska Community Action on Toxics, asked a series of questions, which included: (1) does Toshiba currently hold a license for the 4S Reactor in Japan; (2) would NRC look at concerns related siting a reactor in a flood plain; (3) what would be the long term storage and shipment of radioactive materials from the reactor; and (4) who would pay the cost of decommissioning and clean-up. NRC staff, along with Mr. Yoder and Mr. Johnson, replied: (1) the 4S is not currently licensed in Japan; (2) NRC looks at all items associated with the reactor, including siting issues such as the flood plain, to ensure safety; (3) storage and shipment of radioactive materials will be the subject of one of the white papers being developed by the City; and (4) the licensee is responsible for the costs of decommissioning, and must,

during the licensing process, ensure adequate funding will be available. Ms. Larson also expressed a concern with the lack of government-to-government interaction with the Tribal governments on the potential siting of the 4S Reactor in Galena. Mr. Demoski also expressed a shared concern regarding interactions with the tribal governments. He stated that he would welcome a visit by NRC, if and when NRC planned to visit Galena.

First Chief Peter Captain, Loudon Tribal Council and Chairman of the YRITWC, expressed his gratitude for the open dialogue of the meeting. He stated that the 4S seemed like a good idea; however, more information is needed to understand how it would work. He encouraged all involved to be cognizant of both the pros and cons of the 4S. He was very appreciative to have been kept informed of the meeting. He also shared that as a part of his culture, they are taught to listen, observe, and then conclude.

Tim Bodony, KIYU Radio station in Galena, asked, given the current NRC expertise on the 4S technology, and the greater amount of expertise internationally, whether NRC had looked at transboundary and international issues with obtaining assistance from those abroad. NRC staff replied that NRC had dealt with international issues in previous reviews, and would consider international issues for the 4S. Staff also reemphasized the importance to carefully plan the path forward. Mr. Bodony also asked if, at the end of its 30-year core life, the reactor could be refueled. NRC staff replied that Toshiba, not in attendance at the meeting, would need to provide an answer.

Mr. Lohaus, on conclusion, thanked Mr. Yoder and Mr. Johnson for the opportunity to meet with them, the NRC staff presenters for leading discussions and answering questions on NRC's licensing process, and all meeting attendees for their participation.

Attachments:

As stated

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## Meeting Participants

Name	Organization
1. Phillip McCabe	ATSI (photo support)
2. Charles W. Hess	Burns and Roe
3. Greg White	Idaho National Laboratory
4. Philip Moor	Burns and Roe
5. Christopher Lapp	Christopher Lapp
6. Dennis Skrincosky	Lapp Consulting, LLC
7. Joe Williams	KBR Services, Inc.
8. Paul Lohaus	NRC/NRR
9. Alan Levin	NRC/STP
10. Neil W. Brown	NRC/RES
11. Sher Bahadur	Lawrence Livermore National Laboratory
12. Laura Dudes	NRC/RES
13. Ted Rockwell	NRC/NRR
14. Ann Hodgdon	MPR Associates, Inc.
15. Stuart Rubin	NRC/Office of General Counsel
16. Steve Bloom	NRC/RES
17. Jim Danna	NRC/NRR
18. Sam Lee	NRC/RES
19. Paul Gunte	NRC/Office of the Executive Director (OEDO)
20. Doug Rosinski	Nuclear Information Resource Services
21. Sue Gagner	Shaw Pittman
22. Akio Minato	NRC/Office of Public Affairs (OPA)
23. John Herczeg	Central Research Institute of Energy Research in Japan
24. Matt Wald	U.S. Department of Energy
25. Robert Chaney	New York Times
26. Steven Mirsky	SAIC, Anchorage, AK
27. Scott Brunell	SAIC, Germantown, MD
28. N. P. Kadambi	NRC/OPA
29. Jenny Weil	NRC/RES
30. Lane Hay	McGraw Hill
31. Rosetta Virgilio	Bechtel SERCH
32. Farouk Eltawila	NRC/STP
33. Mindy Landau	NRC/RES
34. John Roots	NRC/OEDO
35. Matias Travieso-Diaz	Chambers, Conlon, & Hartwell, LLC
36. Marvin Yoder	Shaw Pittman
37. Lewis "Tom" Johnson	Galena
38. *Robert Rosenfeld	Galena
39. *Kyle Wright	Yukon River Inter-Tribal Watershed Council
40. *Peter Demoski	Tanana Chiefs Conference
41. *Dan Joling	Nulato Tribal Council
42. *Shawna Larson	Associated Press
43. *Eileen Jackson	Alaska Community Action on Toxics
44. *Cesa Sam	Huslia Tribal Council
45. *TygJules Skywatcher	Huslia Tribal Council
46. *First Chief Peter Captain	Louden Tribal Council
47. *Ragine Pilot	Louden Tribal Council
48. *Dorothy Shockley	Office of Senator Albert Kookech
49. *Tim Bodony	KIYU Radio in Galena
50. Shawn Rochelle Smith	NRC/STP
51. *Pamela Miller	Alaska Community Action on Toxics
52. Scott Morris	NRC/NSIR
53. Al Tardiff	NRC/NSIR

\*Denotes the participation by telephone.

## **AGENDA**

February 2, 2005

1:00 p.m. - 4:00 p.m. EST

NRC Headquarters, O16-B4

The purpose of this meeting is to meet with the Galena, Alaska City Manager to discuss and answer questions on the U.S. Nuclear Regulatory Commission's (NRC) reactor licensing process.

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| 1:00 p.m. | Welcome, Introductions, Groundrules, and Agenda Overview<br>Office of State and Tribal Programs  |
| 1:15 p.m. | Background, Overview, and Status of 4S Project in Galena -<br>Galena City Manager  |
| 2:00 p.m. | Break  |
| 2:15 p.m. | Overview of NRC Organization<br>Office of State and Tribal Programs  |
| 2:30 p.m. | Overview of NRC's Licensing Process<br>Office of Nuclear Reactor Regulation<br>Office of Nuclear Regulatory Research<br>Office of Nuclear Security and Incident Response |
| 3:15 p.m. | Questions and Answers  |
| 3:45 p.m. | Public Discussion  |
| 4:00 p.m. | Adjourn  |