Studsvik™

Attachment Two
Studsvik Comments - Draft EIS
Page 10

Appendix C.6-73:

"C.6.2.10 HAW Denitration, Packaging and Cask Loading Facility (P9J)

...... The denitrator would be a fluidized bed reactor. The evaporator bottoms, mixed with a 2.2M aluminum nitrate solution would be fed into the bed. Kerosene and oxygen would also be fed into the reactor to maintain the reactor temperature of about 600 °C. The aluminum nitrate reacts with the waste to form solid pellets (calcine)."

The Draft EIS provided a summary description of Project Number P9J, HAW Denitration, Packaging and Cask Loading Facility (listed in Table C.6.1-1 and more fully described in section C.6.2.10, page C.6-73).

The THOR[sm] steam reformer operates as an elutriating fluid bed. However, reference should be made to use of electrical heating and auto-thermal steam reforming for maintaining fluid bed operating temperatures of 450 to 700°C. The use of aluminum nitrate can be utilized in the Reformer, however, the use of such additives to prevent alkali; metal agglomerations are generally not necessary with the THOR[sm] Reformer.

COGEMA, INC.

HLW & FD

EIS PROJECT - AR/PF
Control # DC-58

Mr. Thomas L Wichmann
EIS Document Manager
850 Energy Drive, MS 1108
Idaho Falls, Idaho 83401-1563

RECEIVED
APR 14 2000

April 14, 2000

Dear Mr. Wichmann

Subject: COGEMA, Inc. Comments on the "Idaho High-level Waste and Facilities Draft Environmental Impact Statement (EIS)

COGEMA, Inc. is pleased to submit the attached comments on the December 1999 draft "Idaho High-level Waste and Facilities Draft Environmental Impact Statement (EIS)".

58-1
III.D.4 (4)

As summarized in the attachment, there is a cost-effective, mature, industrial technology, which can be used to solidify the INEEL sodium bearing waste. This technology was not considered in the Draft EIS. COGEMA, Inc. encourages the Department of Energy to permit use of this technology in the Final EIS and Record of Decision (ROD).

If there are any questions or if additional information is needed, please contact me at the number referenced below, or Arvid Jensen (208-524-0466).

Sincerely yours,

Rhonnie Smith

Rhonnie Smith
Executive Vice-President, Engineering and Technology

cc:
Arvid Jensen

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1.0 COGEMA, INC. COMMENTS

The December 1999 draft *Idaho High-Level Waste and Facilities Disposition Draft Environmental Impact Statement* (EIS) addresses methods for early processing of Sodium Bearing Waste (SBW). COGEMA Inc. submits the following comments:

1. There is a variant to the Draft EIS alternatives that can process the SBW into a glass waste matrix using industrially available technology. This mature technology option, which was not considered in the Draft EIS, can be accomplished at cost/schedule competitive to those already identified in the Draft EIS.
2. COGEMA, Inc. encourages the DOE to permit use of this mature industrial technology for SBW solidification, in the final EIS and ROD.

2.0 COMMENT BASIS AND JUSTIFICATION

2.1 System Description

2.1.1 Overall SBW Processing System Figure 1 provides a general illustration of the proposed system, which is composed of the following major processes, and/or subsystems, which are all based on mature industrial technologies:

- Off-gas Collection and Purification Processes: This off-gas subsystem will service all of the other subsystems of the SBW processing system, and will provide particularly important support for certain subsystems (e.g., denitration, vitrification, and canister filling)
- Denitration Process: Formic acid will be added to incoming SBW to destroy nitrogen compounds (e.g., nitrates, etc.), prior to feeding SBW to the melter, for vitrification processing. Nitrogen gases resulting from denitration process will be dealt with by the off-gas subsystem.
- Mercury (Hg) Separation: Mercury will be removed from the SBW, during the denitration processing, and will be loaded into small containers, as a secondary waste product for later disposition.
- SBW Concentration Process to Feed Melter: SBW will be concentrated, mainly by removing some of the water, and fed to the vitrification subsystem (melter), as a dilute slurry (i.e., liquid containing some solids).
- Glass Formers to Feed Melter: Most of the materials needed to form the glass (waste form) matrix are not present in SBW, and will be formulated and added as a dry feed to the melter, in the form of a crushed glass (frit).
- Vitrification Processing: This is a combination of thermal and chemical processing that occurs within the melter. The melter, which is the key component of this subsystem, is a metal enclosure designed and fabricated to provide essential processing conditions. The melter has an internal heating system, a system to mechanically stir the incoming feed and glass melt, an external cooling system, and is linked to the off-gas system. The proposed vitrification subsystem uses a unique melter that has been developed by the French nuclear program over the past two decades and industrially applied during the last decade. It offers very substantial technical, cost and schedule advantages over melter designs that heat the melter by electrodes submerged in the glass (e.g., those currently operated by the U.S. DOE).

- Canister Filling Process: Glass waste form material that has completed processing in the melter is drained into thin-walled metal canisters. This process uses a French developed and industrially applied drain valve mechanism located in the bottom of the melter. The metal canisters will be, of a design, common in-type to canisters already being used by the U.S. DOE. Empty canisters will be fed into a carousel racking system, to support the high production rate of glass waste form.
- Canister Sealing Process: After being loaded with the molten glass waste form and allowed to cool, the canisters will be fully sealed by welding.
- Canister Decontamination Process: The canister exterior will be decontaminated to meet the requirements for lag storage, on-site interim storage and off-site transportation, for final disposal.
- Lag Storage Process: The overall processing system will include a handling system to provide temporary storage for a limited number of completed canisters (loaded with waste form), prior to their acceptance by DOE, in preparation for final disposition.
- Load-out Process: Canisters, from lag-storage, will be processed for transportation, in support of DOE preparations for final disposition.

The overall system will thus have the following general processing flow: 1) feed preparation will include processing SBW (i.e., denitration to destroy nitrogen compounds, remove some water to concentrate SBW) and providing glass forming materials in a dry frit feed to the melter), 2) perform vitrification processing in the melter, 3) drain resultant (molten) glass waste from melter into metal canisters, 4) after glass cools to a solid, seal canisters by welding, 4) decontaminate exterior of sealed canisters and 5) place canisters into lag-storage in production facility, in preparation for further disposition by DOE. The canisters of glass waste form (i.e., primary SBW disposal product) will be produced to comply with acceptance criteria for disposal in the DOE WIPP repository, in New Mexico (NM).

The supporting history of development and industrial application (French and licensees), in using combinations of these technologies to process nuclear wastes, will enable a highly integrated, highly automated and remotely operated system to be designed and implemented.

2.1.2 Vitrification Subsystem Because of the importance of the vitrification subsystem, further description is provided for this subsystem. Figure 2 illustrates the basic features and general configuration of this subsystem. The melter vessel is a metal shell that is specially designed and fabricated to enable direct high frequency induction technology to be used to heat the feed and glass melt mixture, during the in-melter processing to create the glass waste form. The molten glass is purposely separated from the vessel wall by a layer of non-molten (cold) glass, which is created and maintained by selectively cooling the melter vessel wall. This allows high temperature operation and limits contamination of the subsystem equipment (i.e., melter vessel, etc.). This technology allows the melter to be small in size and have a very long, if not unlimited, service lifetime. During melter processing, the glass melt is also mechanically stirred, to enable high production throughput, by shortening the glass residence time in the melter and improving product quality by creating a more uniform temperature distribution and by limiting settling of any insolubles. When processing in the melter is complete, the glass waste form is poured into canisters, via a valve mechanism in the bottom of the melter vessel.

This vitrification subsystem is capable of melter operation over a broad range of temperature, because of the high thermal power release produced by direct induction in the glass. Using this combination of technologies (i.e., induction heating, cold glass layer protection and mechanical stirring), this vitrification subsystem is capable of processing, at high production rates, a wide range of feed types, and a wide range of glass compositions, as well as, those for glass-ceramic, or ceramic waste forms. The unique design of the vitrification subsystem, particularly the melter, allows it to be small in size (e.g., 1.4m in diameter for the proposed system) and weight, high in throughput, low in maintenance and amenable to change-out, if needed. These are major advantages over designs for Joule heated melters that use electrodes submerged in the glass melt (e.g. those currently in use by the U.S. DOE). These design features combine to provide substantial benefits to costs (capital installation and operations) and to schedule (design, startup and production).

2.2 Major Advantages of Proposed Variant to Early Vitrification Option for SBW Disposition

2.2.1 Maturity of Technology

Overall SBW Processing System

As evident by the preceding description of the system's subparts, this (SBW) processing system will use mature industrial technology for each stage of the processing, and will be modular in design and installation. Each part of the proposed SBW processing system [i.e., feed preparation, vitrification (melter, etc.), canister filling, sealing and decontamination, and off-gas collection and purification] will all use processes based on industrially mature technologies supported by extensive development testing and industrial production experience. Consequently, there in a high confidence that the proposed system offers a combination of performance advantages that are superior to the other options being considered in the EIS.

Vitrification Subsystem

The following discussion provides a more detailed overview of technological maturity, regarding the vitrification subsystem. Refer to Figure 1 for illustration of the overall system, Figure 2 for illustration of the vitrification subsystem, and Figure 3 for a cross-sectional illustration of the melter, as needed, during the following discussion.

The key portion of the proposed processing system is the vitrification subsystem, and within that subsystem, it is the melter, and its special combination of capabilities, that is most important. The melter design is based on extensive technological development in France and industrial application in France, as well as, several other countries. Since the 1980's, the French Atomic Energy Commission (CEA) and COGEMA have teamed to develop and apply the technology associated with using an induction heated cold crucible melter to prepare glass or glass-ceramic waste forms for immobilizing nuclear wastes. The first-generation of this technology is referred to as the Cold Crucible Melter (CCM) technology, with over 5000 hours of operation, which has qualified the system and its subparts. Development has matured to where this is industrially applied technology. In the last several years, this technology has been provided to domestic and international customers for nuclear (e.g., La Hague, France, Italy and South Korea) and non-nuclear applications (Ferro-France, etc.). The installation at La Hague (France) will go into production in 2003, to vitrify concentrated solutions of very corrosive wastes, and the process is currently being qualified on a full-scale pilot system. The second-generation

is called the Advanced Cold Crucible Melter (ACCM) technology, and in design it primarily differs from the CCM technology in regards to melter configuration (shape) and sizing, but is capable of higher throughput. Production versions of the ACCM technology are already being applied within the French nuclear program, and development testing on other versions continues. The advantages offered by the ACCM technology will be discussed later in this section. Other than the melter vessel, the basic support systems for these two generations of melter technology are essentially common, at least in-type, (e.g., power system, temperature monitoring system, mechanical stirring system, melter control system, etc.), which are tailored to specific system designs.

The melter vessel is fitted with the induction heating capability, cooling system, mechanical stirring of the melt, glass pouring valve and associated control systems. The metallic vessel design has been tailored to optimize use of electrical induction heating technology, in processing feed materials into a suitable glass waste form. Both of these systems (CCM or ACCM) can be set up to process solid feed, liquid-slurry feed or liquid feed. The proposed system for processing the SBW would use a concentrated (SBW) liquid, with some small fraction of solids in it, along with a solid glass frit feed, as the feed for the melter processing. In the melter, the feed and resultant glass mixture is heated, using this direct high frequency induction technology, and processed into a glass waste form. At startup, a brief preheating step must be performed, to enable such Joule heating to begin. The melter vessel (wall) is designed and fabricated to enable some of the energy deposition, from the power system, to occur in the feed and molten glass mixture (i.e., within the interior zone of the melter vessel). The melter vessel and power system are configured and sized to provide the needed processing temperature and throughput capabilities.

An essential design feature, in both the CCM and ACCM technology, is that the melter vessel is purposely cooled, to create a skull-like layer of solidified glass adjacent the inner-wall surface of the melter vessel. This layer acts as a refractory and protects the melter crucible from corrosion and mechanical wear attack, by the constituents in the molten waste form. Because the skull-layer is composed of basically the same materials as the molten waste form, it can provide such protection without contaminating the molten waste form. Constituents released into the glass melt, from refractory bricks or castables, is a relatively common problem that occurs with most other waste-glass melter designs, particularly as their production-life progresses.

The combined effectiveness achieved by the cooling system (skull layer) and the induction heating technology results in both the CCM and ACCM designs having higher ranges of operating temperature capability than other types of joule heated melters, used in preparing waste glasses. These latter melter designs typically use plate or rod electrodes submerged in the glass, and several of these melters are currently being used at U.S. DOE sites. As a further consequence, both the CCM and ACCM technology is capable of processing a wider range of feed compositions into suitable waste form product. For example, the French program is applying such technology to prepare not only glass waste forms, but also to develop production capability for glass-ceramic waste forms, and even high temperature crystalline ceramic waste forms. Perfecting the CCM design regarding the skull layer of cold glass protecting the melter vessel and improving fabrication of the melter vessel have combined to result in major increases in melter vessel lifetimes, so the need for change-outs has been markedly reduced. The ACCM design essentially eliminates the need for change-outs. The small size, low weight and cold glass layer, which helps lessen contamination of the melter vessel, are all important features of the French melter design that also significantly reduce the cost and complexity of their eventual disposal.

Developing the ability to mechanically stir the waste form melt region, which is used in both the CCM and ACCM technology, resulted in significantly increasing waste form production rates, and improving both temperature and composition uniformity within the melt zone. The increased production rate is achieved by reducing the time to process feed into a molten glass condition and by reducing the time to complete the glass making process. The high production rate capability (e.g., 100 kg/hr of glass using liquid feed and 400 kg/hr of glass using solid feed) of the proposed SBW processing system would provide important benefits regarding cost and schedule, for performing this task. The cost and schedule advantages will be discussed in more detail in Section 2.2 and 2.2.3, respectively. The improved composition uniformity includes the important ability to keep certain insoluble constituents such as noble metals particles, inorganic crystals, etc., in suspension within the glass-melt. The settling of such material into the bottom region of other types of melter designs has been an on-going development problem in such systems, both in the U.S. and in elsewhere. The SBW is not expected to present any significant challenges in regards to such undissolved solids within the glass waste form. The fact that finished glass exits both the CCM and ACCM systems by a bottom drain valve also helps ensure that any tendency for material to settle towards the bottom of the melter vessel will not result in accumulations that could become a problem. The combination of technologies used in the French (CCM and ACCM) melter designs has enabled high production throughput to be achieved with melter vessels that are relative small in size and low in weight, which facilitates maintenance and change-outs, as needed. These capabilities have the further benefit of requiring less space to install such components into existing hot-cell facilities or new facilities. It also enables the system to be serviced using lower capacity and thus less costly equipment (e.g. service crane, etc.).

The proposed design for processing the SBW calls for using the ACCM technology. The primary advantages of using the ACCM technology, in this application, are as follows:

- All of the CCM advantages over other waste form processing melters
  - Broader range of processing temperatures
  - Higher production throughput than other types of Joule heated melters
  - Smaller size and lower weight of components
  - Long service lifetimes
  - Easier to maintain and change-out, if needed
- Higher throughputs than the CCM technology (e.g., more than 100 kg/hr with liquid feed)

2.2.2 Cost The proposed system will use processes that are widely recognized as being technical mature and for which there is extensive industrial experience in applying them to processing nuclear materials. In particular, the small size and weight, high throughput capacity, long service lifetime and ease of maintenance of the ACCM technology enables the design of the proposed system to offer very substantial cost advantages (i.e., capital and operational). One of the most significant cost advantages is that the system could very likely be installed in an existing facility. The French program (COGEMA) has recent experience with retrofitting vitrification technology systems (i.e., CCM) into existing nuclear facilities in other countries, and the cost advantages are significant.

The proposed system for processing SBW, is believed to be a variant option that offers significant cost advantages over the options portrayed in the (12/1999) draft EIS, regarding the early vitrification alternative.

This vitrification facility could be effectively attached to the existing New Waste Calcine Facility (NWCF), as an extension, taking benefit from the already existing installations for utilities, personnel support and waste feed supply. The estimated cost for design, construction and startup, of this extension, is 200M dollars; Figure 4 illustrates the estimated funding profile for this work. Based on French experience it is estimated that it will take approximately 20M dollars per year to operate the proposed system, during production.

2.2.3 Schedule Figure 5 illustrates the estimated schedule for the processing SBW with the proposed system. As this schedule illustrates, if the design of the proposed system is initiated before the end of year 2000, the processing could be completed in time to meet the State Agreement (Idaho:DOE) date of 2012, for SBW.

2.2.4 Waste Products Cogema, Inc. estimates the proposed SBW processing system will produce approximately 360 cubic meters of the primary disposal product (i.e., canistered glass waste form). The waste form will be a borosilicate glass. The canister will be made of stainless steel and designed as a thin-walled closed right-circular cylinder, which will be fabricated with one end closed and the other left open for loading in the waste form and then sealing. These decisions, regarding the proposed primary waste form and canister, are extensively supported by over two decades of U.S., European and Asian experience regarding nuclear and hazardous waste disposition. Such experience includes evaluating candidate waste forms, selecting preferred waste forms, continued process and product development, and selection of glass, and especially borosilicate glass, as a preferred waste form. During filling with molten waste form, the canister will be positioned upright, with the open end at the top, when being filled with molten (glass) waste form. After cooling, each loaded canister will be fully sealed, by welding, and then externally decontaminated, in preparation for lag-storage and then follow-on disposition by DOE (i.e., on-site interim storage and/or final disposal). The primary waste disposal product, as well as any secondary product, will be produced so as to comply with acceptance criteria for disposal of remotely handled – transuranic waste (RH-TRU) in the DOE WIPP facility, located in New Mexico.

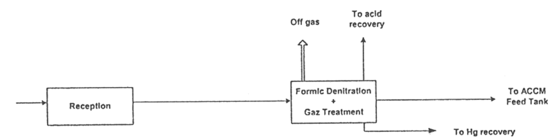
3.0 SUMMARY

The proposed system, for processing SBW, offers several major advantages compared to option candidates evaluated in the 12/1999 draft EIS, for the Non-Separations alternative.

The proposed system will use a set of industrially mature processes whose combination offers a high confidence for achieving the customer's technical, cost and schedule goal. The unique set of technologies used in the vitrification subsystem will enable this subsystem to be small in size and weight, have a broad range of capability for processing feed into glass, and will have high production throughput and operational reliability. The overall system will be modular, highly integrated and automated and remotely operated. The modular design and size and weight advantages of key components would enable it to be installed in an existing facility, providing significant cost and schedule advantages. The industrially mature nature of the processes, high production throughput, modest sizing, low maintenance and servicing change-out capability will provide significant cost advantages (i.e., capital and operational). The installation and operational advantages of the system could enable the State Agreement date of 2012 to be met. The waste disposal products will comply with acceptance criteria for disposal as RH-TRU in the DOE WIPP facility, in NM.

It is for these reasons that COGEMA, Inc. encourages the DOE to permit use of this mature industrial technology for SBW solidification, in the final EIS and ROD.

Block Diagram



System Schematic

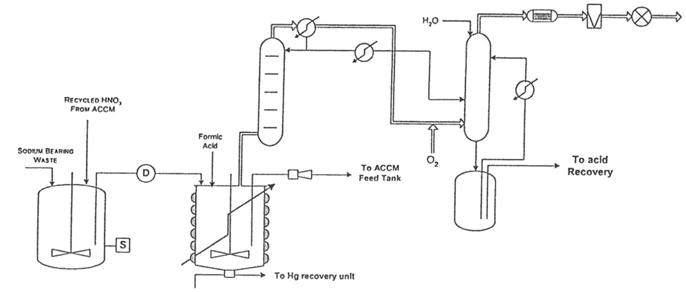


FIGURE 1 SBW PROCESSING SYSTEM

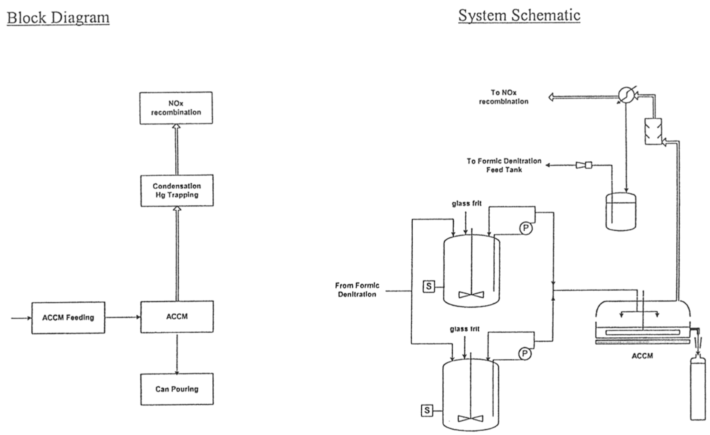


FIGURE 2 VITRIFICATION SUBSYSTEM

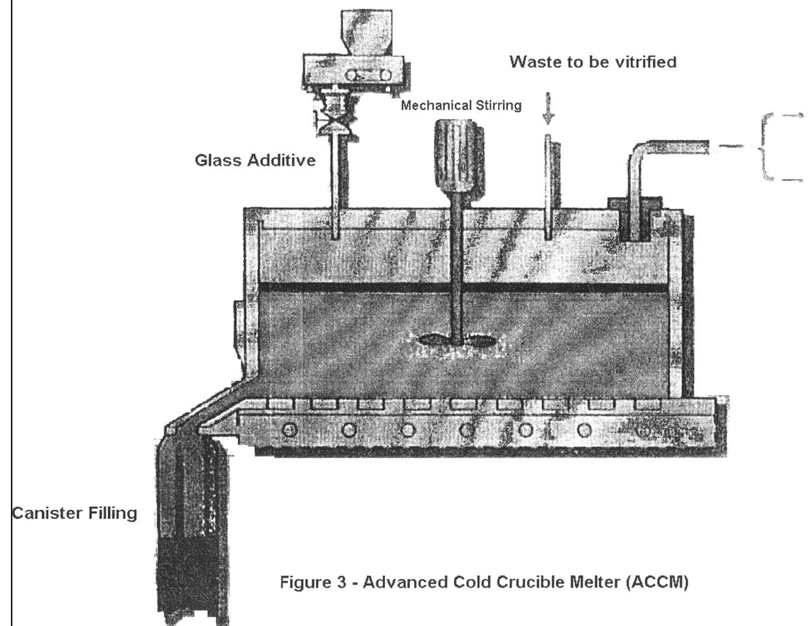


Figure 3 - Advanced Cold Crucible Melter (ACCM)

SBW IDAHO / ACCM

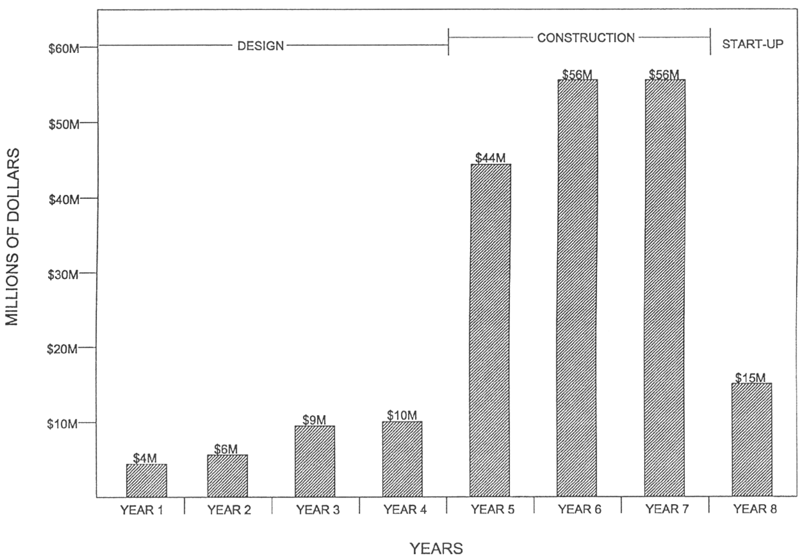


FIGURE 4 Estimated Cost Profile

SBW IDAHO / ACCM

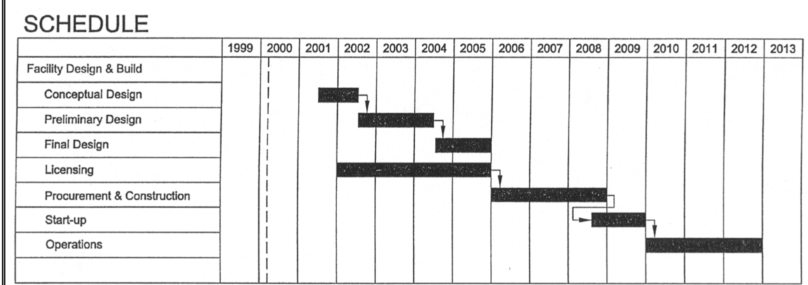


FIGURE 5 Estimated Schedule for SBW Processing

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EIS PROJECT - AR/PF
Control # DC-59

HLW EIS Web Comments

From:	HLWFDEIS Web Site
Sent:	Friday, April 14, 2000 11:27 AM
To:	web@jason.com
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Telephone: 208-524-0240
Date Entered: {ts '2000-04-14 11:26:38'}
Comment:
Comments of the use of "Estimated 100-year peak flows and flow volumes in the Big Lost River and Birch Creek at the Idaho National Engineering Laboratory", U.S. Geological Survey, WRI 96-4163 for flood hazard delineation in the HLW EIS.

59-1 VIII.C (5) The USGS report cited in the HLWDEIS (Estimated 100-year peak flows and flow volumes in the Big Lost River and Birch Creek at the Idaho National Engineering Laboratory, U.S. Geological Survey, WRI 96-4163) does not represent the 100 year flow at the INEEL. The combined probability of all the assumptions used to obtain this flow frequency estimate results in a frequency of the calculated flow which is much less than 1/100. The DOE should not base programmatically critical decisions on such an extremely conservative flood hazard assessment.

59-2 VIII.C (5) The detailed comments below rigorously demonstrate the internal inconsistencies of the report and strongly suggest that it should be revised to address these internal inconsistencies, technical inaccuracies, and lack of mathematical rigor in determining the 100 year flow for the INEEL. Although it could be argued that the report represents "standard procedures" for the determination of a 100 year flow, these procedures clearly do not apply to the Big Lost River below th
e Mackay dam and the procedures are generally applied in a manner designed to produce the largest possible flow, independent of what the real frequency of that flow may be.

59-3 VIII.C (5) The potential impact of such extremely conservative flood hazard assessments could include decreasing resources for the mitigation of real risks. The rational risk based allocation of resources requires that flood hazard assessments be as systematic, thorough, and peer reviewed as possible. The comments below indicate that the USGS report meets none of these requirements.

Detailed Comments

59-4 VIII.C (5) Pg. 5- "Most surface-water inflow to Mackay Reservoir is the result of melting snowpacks." Such a record may not be homogeneous and require special treatment (see Bulletin 17B for example). The text should also note that the design discharge of Mackay dam is 3,250 CFS and historical releases from the dam for the floods cited.

59-5 VIII.C (5) Pg. 7- "Current estimates of flood frequency distributions for ungaged streams in Idaho are based on analyses done in 1977 and do not incorporate more recent peak-flow data or newly developed estimating techniques.", "Because of the amount and nature of additional data, current computed flood frequency values are likely to be substantially different from those used by Kjelstrom and Moffatt (1981) to develop their equations."- C. Berenbrock.
What is the effect of new data on the 1981 regional regression estimates?
How does the rain on snow effect affect homogeneity? What are the indirect methods used for the Arco 1965 flow? What are the uncertainties? How were they incorporated? How was this outlier used? Why is it legitimate to compare and include the indirect measurement with gage measurements? Where is the documentation to support this important flow value?

59-6 VIII.C (5) Pg. 8- "The estimates are less reliable where the natural peak flows have been significantly altered because of storage and diversion structures." Exactly what are the bounds on reliability for the reach downstream of the diversion dam?
The Interagency Advisory Committee on Water Data Bulletin 17B (1982) states, "The procedures do not cover watersheds where flood flows are appreciably altered by reservoir regulation or where the possibility of unusual events, such as dam failures, must be considered." ; Summary, pg. 2-3. The Mackay dam is classified as a "high hazard" dam by the State of Idaho and clearly regulates Big Lost River flow.
Clearly, the log-Pearson III procedure should not be applied to the watershed below the Mackay dam. If the IACWD 17B were to be followed, it also recommends tests and procedures for rain on snow non-homogeneity, zero flow years, and outliers, such as the 1965 Arco data. None of these issues is explicitly addressed in this report with respect to the

1

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"recommended" IAWCD procedures.

59-7 VIII.C (5) Pg. 9- Why is it appropriate to add the Howell Ranch data in downstream of Mackay dam given that the slope and elevation of the Howell Ranch area is significantly different from the rest of the basin?
There is a mathematical problem with the statement that- "Flood-frequency analysis resulted in a 100-year peak flow of 4,880 ft3/S at the Howell Ranch gaging station and compared favorably with the highest recorded peak flow of 4,420 ft3/S on May 25, 1967." There is no independent evidence for the frequency of the May 25 flow. It could have been a 5 or 5,000 year flow. Thus, the assertion that the 100 year flow is good because it "compares favorably" is mathematically invalid. At best, it relies on consensus and no real independent evidence.
There is an internal consistency problem related to actual and computed flow estimates for Howell Ranch and Arco. The 100 yr flow is 10% higher for Howell Ranch (which is apparently acceptable because of historic and consensus data) and 290% higher for Arco (which is acceptable in the report but inconsistent with historic and consensus data). Gage data indicates that flows above the Mackay dam, below the Mackay dam and at Arco are less than Howell Ranch .
What was the release rate assumed for Mackay dam? What was the release rate during the 1967 floods? The assumption that the dam was full is a deterministic worst case assumption that that should be evaluated probabilistically to determine the true 1% (1/100) chance per year flow. If the dam has been full once since 1917, the annual probability is 1/83 and the computed 100 year flow is now a 1/8300 flow with a 8,300 year return period.

59-8 VIII.C (5) Pg. 10- Why was a regression equation used to calculate what could easily be obtained from field data? Topographic maps indicate that the area of infiltration for the Chilly sinks is much larger than what is computed using the Dawdy equation. What is the standard error for this equation?
Infiltration was adjusted according to rock type but the rocks are inaccurately characterized as "carbonaceous". There are few or no carbonaceous rocks in the Big Lost River Valley or adjacent mountains. This type of inaccuracy in basic geohydrology leads to questions regarding the quality of internal review and the validity of the infiltration rate adjustments. Where are the detailed maps supporting assertions regarding rock type?

59-9 VIII.C (5) Pg. 11- If the width ranged from 200 ft to more than 1,000 ft; how can 350 ft be "representative"? In what sense is the term "conservative" used?

59-10 VIII.C (5) Pg. 12- What was Mackay dam releasing during the "full or nearly full" conditions? What does "full or nearly full" mean with respect to quantitative reservoir capacity and dam discharge? What are the combined probabilities for the 6 assumptions (per ANSI 2.8)? What are the bounds on the inputs described as "probably reasonable"? There is inadequate discussion of the simulation inputs to assess their accuracy and impacts on the assumptions. Likewise, none of the flow versus frequency curves are presented for critical evaluation. No evidence is provided showing that the gauge stations are responding only to a simultaneous regional rainfall event. A separate event could have occurred in the Antelope watershed providing a peak independent of the Howell Ranch event. This scenario is more consistent with local meteorology. No hydrographs are presented to support the assertions regarding the timing of peak arrivals. No evidence is provided on the timing of these peaks with respect to the Big Lost River p
eaks. The longest computed travel time was 6 hours from Howell Ranch to Arco. How does this compare with real data? The 1965 flow peak took 7 days to reach Arco from Howell Ranch and was reduced by 28%. This observation, the lack of graphical data, and the many assumptions involved in computing the peaks call into question the assumption that- "peak flows are not significantly attenuated, travel times are relatively fast, and sub-basin peaks occur within a relatively short period of time; thus the assumption that subbasin peaks occurred simultaneously is probably reasonable." What is the probability? Where do the subbasin peaks occur? The combined probability of all these assumptions actually occurring is far less than 1% per year.
The assumption that reservoir effects are minimized by taking an estimated 100 year flow from Howell Ranch and applying it to Arco is extremely conservative and inconsistent with the differences of elevation, topography and hydrology of the 2 regions.
No evidence is provided that the effects of reservoir regulation are variable and indeterminate. The record seems to indicate that the design discharge of 3,250 CFS has never been exceeded. No attempt was made to systematically evaluate the effects of reservoir storage. This subject is covered in most engineering hydrology textbooks. For example, the record shows that the reservoir contains a daily average of 32,500 acre-feet of water during June (maximum capacity= 38,500 acre-feet). Given the available reservoir data, It is reasonable to expect that this data would be presented and rigorously characterized in the report before it was asserted that reservoir effects were variable and indeterminate.
Flows as much as 2,000 CFS smaller than the Howell Ranch peak have been recorded entering Mackay reservoir the same day. If the intent is to remove the effect of Mackay reservoir, why not optimize the data available for the gage just upstream of Mackay Reservoir and input it just downstream of the reservoir?
Similar losses downstream of Mackay occur due to infiltration, even after removing the effects of irrigation.

59-11 VIII.C (5) Pg. 13- The assumption that Box Canyon infiltration is balanced by runoff may be valid but inadequate data is presented to justify this assumption. For example, Bennett (1986) found that 30% infiltration occurred in the Arco to Diversion dam reach and the basin area is only 60 square miles. What is the probability that there would be adequate rainfall (about 6 times the average) to offset infiltration and that it would occur at the same time the peak is in Box Canyon? How would infiltration effect the attenuation model? This (as well as other) assumptions seem to require that the "100 year rainfall?"

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occur simultaneously across the entire Big Lost River watershed. This assumption is not consistent with the meteorology of the region and again calls into question the validity of the assertion that the assumptions represent conditions that have a 1% chance per year of occurring. The data that is presented in the report shows a decrease of 12% between Arco and the INEEL diversion dam.
An internal consistency problem presents itself with respect to the 2 hour hydrograph for Box Canyon. If the peak can go at least 50 miles from Howell Ranch to Arco in 6 hours (as asserted in the text); why can't it go the 7.5 miles in Box Canyon in 2 hours? The resulting attenuation of 170 CFS would seem to be legitimate and required given data presented earlier.

59-12 VIII.C (5) Pg. 15- The channel width discussion here indicates a serious inconsistency. If the Dowdy equation is used here, a channel width of 144 ft. is indicated but a bankfull width of only 38 ft. was measured. The Dowdy equation has a large uncertainty associated with it that must be quantitatively addressed. A more serious inconsistency is the selective application of the bankful discharge technique cited as "Harenberg, 1980". A similar estimate of "bankful" flow at the INEEL would lead to typical estimates of 2500 CFS for the 100 year flow. Why wasn't this important data point considered?

59-13 VIII.C (5) Pg. 16- "These assumptions would produce the largest possible flow-volume estimates for this method." The largest possible flow is by definition not a 100 year event. Also note that Bulletin 17B is not intended for the determination of flow volumes. The combined probability of a 100 year flow and a 60 day duration and a simultaneous arrival of subbasin peaks at Arco and the Howell Ranch peak arriving at Arco unattenuated and arriving at the INEEL diversion dam unattenuated is clearly much less than 1/100.

HLW & FD

EIS PROJECT - AR PF
Control # DC-60

HLW EIS Web Comments

From: HLWFDEIS Web Site
Sent: Friday, April 14, 2000 6:45 AM
To: web@jason.com
Cc: web_archive@jason.com
Subject: HLW EIS Web Comment

RECEIVED APR 14 2000

Name: Tom Oliver
Affiliation: Studsvik, Inc.
Address1: 111 Stonemark Lane
Address2: Suite 115
City, State Zip: Columbai, SC 29210
Telephone: 803-731-8220
Date Entered: {ts '2000-04-14 06:45:19'}
Comment:
Studsvik,Inc. has recently commercialized on a large scale its patented pyrolysis/steam reforming fluid bed technology for the processing of nuclear wastes generated by the nuclear power stations at its processing facility in Erwin, TN. This technology is also directly applicable to the processing of a large quantity of the mixed wastes presently within the DOE including the SBW at INEEL. Under separate cover, Studsvik has submitted comments on the draft EIS that requests that steam reforming, an alternative to incineration, be considered in the final EIS. This technology was not full deployed when the technical evaluations for the EIS were performed, however it is now a fully proven, fully deployed technology that offers significant advantages over present processing methods and those discussed in the draft EIS.

60-1 III.D.4(4)