APPENDIX C
SOCIOECONOMIC IMPACTS

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C. SOCIOECONOMIC IMPACTS

Six alternative hardware systems for standardizing the management of post-examination naval spent nuclear fuel are considered in this Environmental Impact Statement (EIS). These systems have been analyzed with regard to storing, transferring (moving on-site), transporting (moving off-site), and disposing of spent nuclear fuel. This appendix discusses the socioeconomic impacts associated with each of the following six alternatives:

- Multi-Purpose Canister,
- No-Action,
- Current Technology Supplemented by High-Capacity Rail Cask (Current Technology/Rail),
- Transportable Storage Cask,
- Dual-Purpose Canister, and
- Small Multi-Purpose Canister.

This appendix is organized in four sections. Because no (or very limited) migration of workers from other locations into the local area is expected to occur under any of the alternatives, no associated effects are expected, such as changes in demand for local housing, public services, or public finance. The analysis did not, therefore, include these topics in the assessment of socioeconomic impacts of manufacturing. Section C.1 describes the methodology used to assess potential impacts of manufacturing the necessary hardware components for each alternative in the representative manufacturing location. The results are presented as average annual impacts for output (the total value of goods and services produced locally), income (total wages, salaries, and property income), and employment (total person-years). Impacts are discussed in relative terms as a comparison of the absolute impacts of each technology with the local baseline, which in the near term includes the No-Action Alternative.[1] Section C.2 describes the potential impacts of storage and handling activities at the Idaho National Engineering Laboratory (INEL) associated with each alternative. Section C.3 describes the potential socioeconomic impacts anticipated to result from transporting naval spent nuclear fuel using any of the six alternative container systems. Finally, Section C.4 discusses the cumulative socioeconomic impacts involving activities considered in this EIS and other activities involving spent nuclear fuel.

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[1] The No-Action Alternative makes use of currently available technology. Until 1998, No Action would produce no socioeconomic impacts because it would represent a continuation of current activities. Once manufacturing commences in 1998, production of required equipment would begin — yielding associated impacts on output, income, and employment.

C.1 Impacts of Manufacturing Alternative Spent Nuclear Fuel Container Systems

Currently, no facility has been selected for fabricating the hardware associated with any alternative. As a result, the analysis of socioeconomic impacts associated with manufacturing the hardware associated with the storage, transportation, and disposal of spent nuclear fuel focused on a representative manufacturing location. Key characteristics for this representative location (e.g., local population, local employment, local income, and facility employment) were defined as averages of the same characteristics associated with each of five existing facilities that currently manufacture casks and canisters for the storage and transportation of spent nuclear fuel — thereby providing an empirical range of possible values from actual manufacturing settings. The analysis considered all major hardware components of each alternative. Note that because unit costs vary between the components used in the different alternatives, the overall cost of an alternative with more total components may be less than the overall cost of another alternative with fewer total components.

C.1.1 General Basis and Methodology

The assessment of socioeconomic impacts associated with fabrication activities was based on three elements. First, engineering cost data for existing and proposed spent nuclear fuel management systems provided information on the unit cost of each component used in existing and planned storage and transportation technology. Second, information on the management of naval spent nuclear fuel under each alternative was used to determine the number of units associated with each technology that would be manufactured annually. Finally, the Impact Analysis for Planning (IMPLAN) input-output computer program was used to estimate economic impacts in the county or counties surrounding existing manufacturing locations (Minnesota IMPLAN Group 1995).

Engineering cost data provided the main input to the economic input-output model. For each major component of a particular alternative, unit costs were obtained from vendors or estimated based on similar existing hardware (if such a component had never been manufactured before). These unit costs were then summed to produce an overall cost for each alternative, from which an annual average was calculated over the entire manufacturing period. The average annual cost for a particular alternative provided the average direct economic impacts for the representative manufacturing site, and in turn was used to estimate the secondary economic impacts for all other economic activities in the region containing the site. Note that because alternatives consist of different components with differing associated unit costs, the total cost of one alternative may exceed that of another with fewer total components, depending on the expense of the separate hardware elements comprising each alternative.

Input-output analysis was used to assess the economic impact of each alternative because this approach provides estimates on both the direct and secondary impacts of a particular activity on a local economy. Input-output analysis concerns the economic accounts of any given region and shows the flow of commodities to industries from producers and institutional consumers. The accounts also show consumption activities by workers, owners of capital, and imports from outside the region. Direct economic effects would occur as manufacturing facilities purchased materials, services, and labor required for each cask and canister system. Secondary effects would occur as the industries and households supplying those industries that are directly affected adjusted their production and spending behavior in response to increased incomes. Impacts were measured in terms of output, income, and employment.

The socioeconomic analysis used the IMPLAN input-output model to measure impacts of fabrication at the manufacturing sites. IMPLAN is a computer-based program that allows construction of input-output models for counties or combinations of counties for any location in the United States. The IMPLAN model contains 528 sectors representing industries in agriculture, mining, construction, manufacturing, wholesale and retail trade, utilities, finance, insurance and real estate, and consumer and business services. The model also includes information for each sector on employee compensation; proprietary and property income; personal consumption expenditures; federal, state, and local expenditures; inventory and capital formation; and imports and exports.

The assessment of socioeconomic impacts was limited to the estimation of the direct and secondary impacts of manufacturing activities. No assessment was made of the impacts of manufacturing activities on local jurisdictions. Such an analysis would include the estimation of impacts on county and municipal governments and on school district revenues and expenditures. Production of casks and canisters would likely take place at existing facilities alongside existing product lines. It is unlikely that there would be substantial migration of workers into the localities surrounding the manufacturing sites under any alternative, and, as a result, no significant change would be likely to occur in the disposition of local government or school district revenues and expenditures beyond those that would occur with fluctuations in baseline economic activity.

To perform the analysis, IMPLAN economic data for each of the counties in which five existing manufacturing facilities are located were used to estimate output, income, and employment multipliers for the sector manufacturing spent nuclear fuel storage and transportation components. Multipliers are used to calculate the secondary effects on an area economy in response to the introduction of direct effects. The multipliers estimated for each existing facility were then averaged to produce multipliers for a representative manufacturing location, with the composite multipliers used to analyze the impacts of each alternative.

C.1.2 Impacts

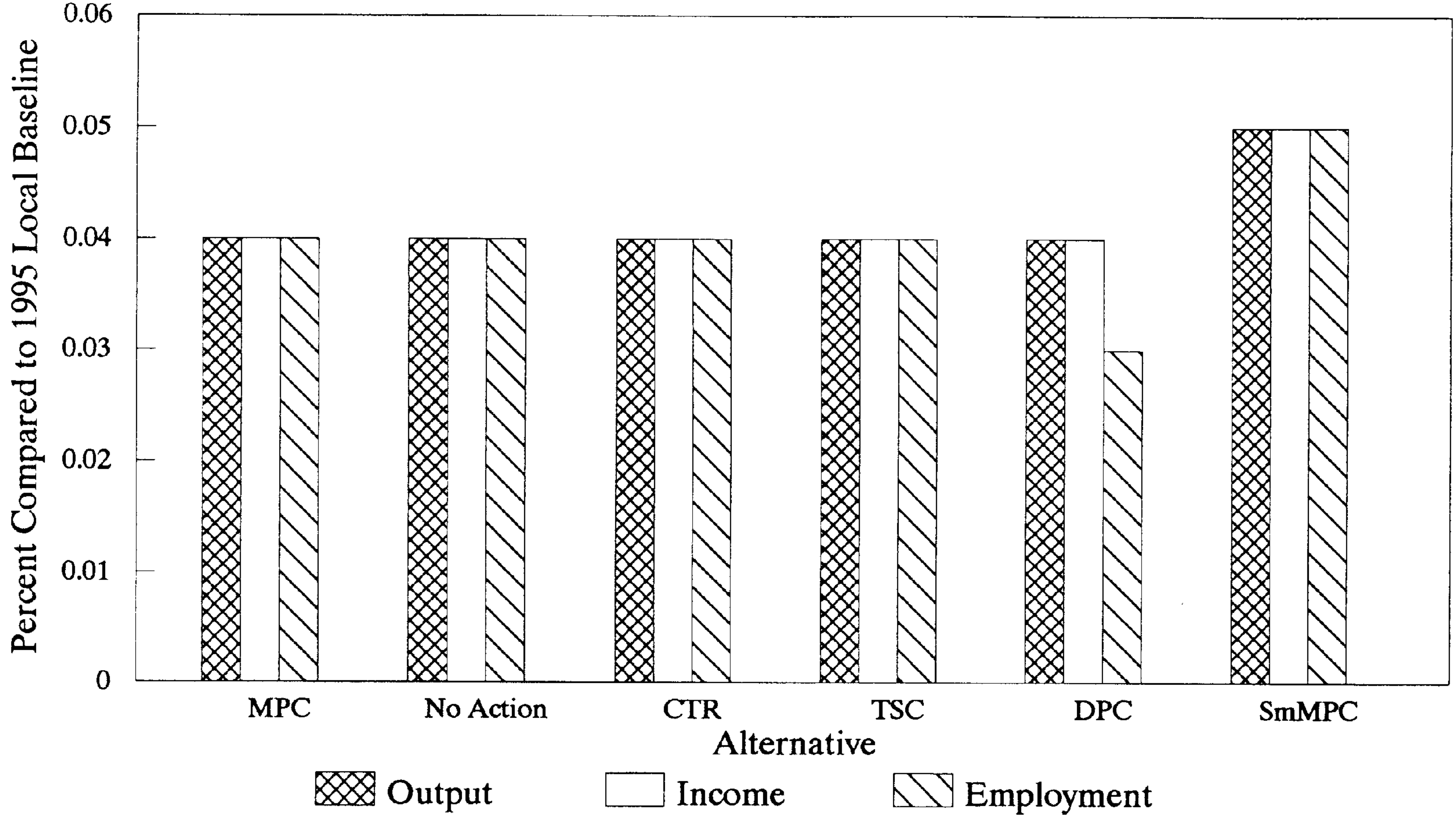
Table C.1 presents socioeconomic data and impacts on output, income, and employment for all six alternatives at the representative manufacturing location. The largest annual average impacts occur for the Small Multi-Purpose Canister Alternative, with average annual impacts on output, income, and employment projected at \$15 million, \$8 million, and 180 person-years, respectively. In contrast, the smallest average annual impacts are associated with the Dual-Purpose Alternative, projected at \$10 million for output, \$6 million for income, and 130 person-years for employment. Impacts of the remaining four alternatives lie between those extremes.

Figure C.1 enables a visual comparison of all alternatives in terms of their relative impact on output, income, and employment. As depicted in this figure, the projected impacts for an average year of manufacturing are relatively small for all container systems considered. On the basis of its socioeconomic characteristics, the representative socioeconomic setting considered should be able to accommodate all of these impacts without a need for additional workers moving into the area because the magnitude of the impacts is anticipated to be small. As a result, socioeconomic impacts are expected to be negligible for all alternatives.

TABLE C.1 Annual Average Impacts of Manufacturing Alternative Container Systems

Alternative	Output[a]		Income[a]		Employment	
	$\$10^6$	% impact[b]	$\$10^6$	% impact[b]	person-years	% impact[b]
Multi-Purpose Canister						
Annual average	11	0.04	6	0.04	140	0.04
No-Action						
Annual average	12	0.04	7	0.04	150	0.04
Current Technology/Rail						
Annual average	12	0.04	6	0.04	140	0.04
Transportable Storage Cask						
Annual average	12	0.04	7	0.04	150	0.04
Dual-Purpose Canister						
Annual average	10	0.04	6	0.04	130	0.03
Small Multi-Purpose Canister						
Annual average	15	0.05	8	0.05	180	0.05

[a] Output and income impacts are expressed as millions (10^6) of 1995 dollars.
[b] % impact refers to percent compared with the 1995 local baseline, rounded to the nearest 0.01%.



Notation: MPC = Multi-Purpose Canister; CTR = Current Technology/Rail; TSC = Transportable Storage Cask; DPC = Dual-Purpose Canister; SmMPC = Small Multi-Purpose Canister.

FIGURE C.1 Summary of Impacts of Manufacturing Hardware Components in the Representative Manufacturing Location

C.2 Storage and Handling Impacts of Alternative Container Systems at INEL

The analysis of socioeconomic impacts related to storage and handling of naval spent nuclear fuel focused on activities at INEL. Currently, all naval spent nuclear fuel is stored and handled at INEL, which already maintains the necessary equipment and personnel to conduct these activities under the No-Action Alternative. Socioeconomic impacts would occur under the remaining alternatives, differing slightly from those associated with No-Action because of changes in expenditures on labor and materials resulting from use of the different technologies. However, given the relatively small amount of spent nuclear fuel to be dealt with over a 40-year period and the minimal changes in staff and equipment that would be required compared with baseline conditions that already exist, these impacts would be negligible. Because of the small magnitude of anticipated socioeconomic impacts associated with the use of alternative technologies for storage and handing at INEL, no quantitative estimate of these effects was prepared.

C.3 Transportation Impacts

Socioeconomic impacts would be associated with the transportation of naval spent nuclear fuel to either interim storage or a repository. However, these impacts are anticipated to be negligible and geographically dispersed. Because loading and unloading naval spent nuclear fuel would also involve relatively small amounts of activity over 40 years, it would require few if any additional personnel to conduct these activities. Transportation costs themselves would also occur over a long time period, and be paid to the appropriate component(s) of the rail line finally selected (with the location of these components at the appropriate rail company offices, probably near neither INEL nor a repository). Moreover, on the basis of the expected annual number of shipments, the transportation of naval spent nuclear fuel would be small compared to the expenditures associated with the shipment of all other goods along the representative routes. As a result, naval spent nuclear fuel shipments would likely be made within the existing capacity of the transportation system, resulting in negligible socioeconomic impacts. Because of the small magnitude of anticipated socioeconomic impacts associated with the use of alternative technologies for transporting naval spent nuclear fuel, no quantitative estimate of these effects was prepared.

C.4 Cumulative Socioeconomic Impacts

The greatest socioeconomic impacts due to the fabrication of hardware required for the management of spent nuclear fuel would be that associated with civilian fuel. For the six alternatives considered in this EIS, the increased average annual output, income, and employment associated with the fabrication of container systems for naval spent nuclear fuel at a representative site would be less than 1% of that anticipated to accompany the production of similar container systems for civilian spent nuclear fuel at the same site. The average annual socioeconomic impacts due to manufacturing components for both naval and civilian spent nuclear fuel would, in turn, be less than 1% of the total annual economic activity in the region containing the representative fabrication site. The consequences of such effects would be slight increases in economic activity in the region surrounding a manufacturing facility. Any difficulties that might accompany these impacts, in the form of increased demand on public services or infrastructure, would be small to non-existent due to the limited increase in area population that they would generate.

Cumulative socioeconomic impacts associated with storage and handling would involve naval spent nuclear fuel, DOE-owned spent nuclear fuel, and civilian spent nuclear fuel. The last category of spent nuclear fuel is geographically dispersed across the United States at facilities that currently store it. Socioeconomic impacts would be similarly dispersed for the storage and handling of civilian spent nuclear fuel, and not geographically proximal to those resulting from the storage and handling of naval spent nuclear fuel. Storage and handling spent nuclear fuel at INEL is anticipated to result in small socioeconomic impacts, in the form of a less than 3% increase or decrease in demand for employment, depending on the approach taken to managing that fuel (DOE 1995, Volume 1, Chapter 5). Storage and handling activities associated with naval spent nuclear fuel at INEL would either help to dampen negative socioeconomic impacts or slightly increase the negligible positive impacts. In both scenarios, cumulative socioeconomic impacts at INEL are anticipated to remain negligible.

Cumulative impacts associated with the transportation of naval, DOE-owned, and civilian spent nuclear fuel are anticipated to be negligible. Loading activities would be geographically dispersed throughout the United States over 40 years at spent nuclear fuel storage sites and likely would involve existing equipment and personnel. Socioeconomic consequences associated with actual transportation of spent nuclear fuel similarly would be dispersed throughout the United States, focusing on the appropriate offices of the rail lines ultimately selected to carry the shipments. Even in the cumulative case, total expenditures required to ship spent nuclear fuel would be small compared with the cost of shipping all goods along rail routes. As a result, such shipments could likely be made within the existing capacity of the rail system, with neither additional allocation of resources nor noteworthy socioeconomic changes occurring along any of the representative routes considered. In any case, cumulative socioeconomic impacts due to the transportation of spent nuclear fuel are anticipated to be small and positive.