# The Environmental and Economic Legacy of the Nuclear Arms Race on the Communities of the Nuclear Weapons Complex: A Commentary on Jurgen Brauer

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Decisions regarding the future of the facilities that developed and manufactured nuclear weapons will fundamentally affect U.S. communities that have been caught in the orbit of the nuclear weapons complex. At the local level the discussion as to whether or not to accept changes that would result either in closing the facilities or redefining their missions has turned on jobs. In more recent years, however, the jobs issue has become more intimately linked to environmental restoration, rather than continued weapons work.

Nonetheless, it is interesting to imagine what an alternative future might be for these communities were there no nuclear weapons complex. In this vein, the article by Jurgen Brauer helps us understand the concrete meaning of such an alternative path of development. Indeed, Brauer's work might be elaborated by comparing the number of toxic waste sites and superfund sites in and around those communities servicing the weapons complex with the number of sites at communities that might have been, but were not, selected as hosts for a nuclear weapons facility. Indeed, the nation as a whole faces similar decisions today and we need to consider carefully all of the implications for future generations.

Communities long dependent on the economic activities of the nation's nuclear weapons complex are facing momentous changes as the Clinton administration and Congress consider proposals to restructure nuclear weapons-related activities and down size the Department of Energy (DOE). The administration has appointed a commission, chaired by Robert Galvin, the former head of the Motorola corporation, to recommend ways to consolidate the nuclear weapons research and development and other research functions of the DOE. Perhaps more far reaching, in December, 1994 the administration proposed that DOE cut $4.4 billion from its environmental cleanup budget over the next five years.

On another front, the Clinton administration's review of the future requirements for nuclear weaponry in the post-Cold War era has essentially left unaltered the strategic nuclear forces agreed to under the START II Treaty, thereby delaying further decisions about future disarmament. Nonetheless, the professed commitment by the administration to renew the Non-Proliferation Treaty and to negotiate a comprehensive test ban treaty

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does raise the prospect of further restructuring of the nation's nuclear weapons complex. Meanwhile, the administration is developing a "nuclear weapons stewardship" program that places a premium on advancing nuclear weapons physics, as well as maintaining and monitoring the existing nuclear arsenal. Despite possible consolidation of nuclear weapons design, and a halt to nuclear testing at the Nevada Nuclear Test Site, the administration's currently proposed nuclear steward ship program will likely require an expansion of the DOE's nuclear weapons research, development,and testing budget [1].

Taken together, these factors may alter the recent trends -- evident since the end of the Cold War -- towards decreasing nuclear weapons research and increasing environmental cleanup and conversion work within the DOE's overall budget. Federal budget constraints imposed by deficit reduction measures, and the shift in congressional power, imply major trade-offs within DOE's budget. Thus, communities directly affected by the activities of the DOE nuclear weapons complex may see a halt to the growth of employment in environmental restoration work, a slowdown of conversion and technology transfer to relevant commercial work, and an increase in nuclear-weapons-related research.

While it is debatable whether the nuclear stewardship program will enhance national security, the budgetary trade-offs of such a shift in priorities raise questions about how lower spending on environmental cleanup will affect the environmental health and safety of the communities surrounding the nuclear weapons complex. Furthermore, this shift in DOE activities will have definite effects on the employment trends within the nuclear weapons complex. The job creating effects of environmental cleanup operations will be slowed and the investments in capital-intensive weapons research will produce relatively fewer jobs.

In this context, the nation faces daunting choices about how to spend its limited resources after the Cold War and how to evaluate the costs and benefits of alternative priori ties. Economists often call such comparisons of alternative priorities "opportunity costs," defined as the foregone benefits of one option when another is chosen. This article provides a brief overview of such changing priorities and the effects on trends in employment, environmental, and military-related investments by the DOE. The article concludes with a brief comment on the often opaque choices that communities face in deciding whether to embrace or reject further militarization in the name of economic development.

## Changes in the Nuclear Weapons Complex

Since the end of the Cold War, the U.S. Department of Energy's budget for Atomic Energy Defense Activities has remained fairly stable. The reduction in strategic weapons procurement, however, stemming from both actual arms treaties and reduced tensions, has had a substantial impact on the U.S. nuclear weapons complex. Spending for the production of nuclear materials and warheads carried out by the U.S. Department of Energy has been dramatically scaled back. In contrast, the massive environmental damage from the 45-year nuclear arms race has required significant new spending to begin the daunting task of cleaning up the nuclear weapons design and production facilities. Recent estimates suggest the cleanup costs of the entire weapons production complex will amount to $300 billion [2,3]. As DOE officials have noted, these environmental cleanup activities have given them a "new mission" that will last into the middle of the 21st century.

Despite cost savings from reduced nuclear materials and weapons production, by fiscal year 1992 the total DOE defense-related budget had increased in real terms since 1989, with spending reaching more than $12 billion. Only recently has the DOE defense-related budget begun to decline, with appropriations amounting to $10.4 billion for 1995 [4,5]. Within the budget, however, spending for environmental cleanup and waste management has grown from $1.7 billion in 1989 to $5.5 billion for 1995 [6]. Until recently, the environmental portion of the budget had been projected to increase significantly over the next several years as the environmental cleanup effort proceeded. But in December, 1994, President Clinton announced cutbacks of $4.4 billion in the environmental management and cleanup program over the next five years.

These changing priorities have been reflect ed in the total employment supported by the DOE weapons-related budget since the end of the Cold War. As recently as 1993, job displacement from reduced nuclear weapons work appears to have been relatively modest, because many workers are being transferred from actual weapons production to new environmental cleanup activities. As Table 1 shows, there had been a steady increase in total employment in the weapons complex since 1986, until 1994, when there was a slight decrease in overall employment. Nonetheless, overall employment still stands at a higher level than at the height of the Reagan military buildup.

As the table shows, employment in nuclear weapons production facilities has fallen by more than 8,000 since 1986.

**Table 1. Employment in Department of Energy Defense Activities by Contractor Classification**

| | Employment | | | |
|---|---|---|---|---|
| *Category* | *1986* | *1988* | *1992* | *1994* |
| Weapons Production | 27,112 | 25 583 | 23 265 | 18,847 |
| Source and Special Materials Production | 22 836 | 24,150 | 34,064 | 31 117 |
| DOE University Labs | 30 203 | 29 248 | 31,821 | 27,745 |
| DOE Industrial Labs | 30,330 | 29,387 | 34 864 | 32,230 |
| Other R&D Facilities | 1 343 | 1,452 | 1,944 | 1 790 |
| Support and Maintenance Costs | 13 867 | 15 214 | 18,002 | 14,786 |
| Construction | 2,791 | 2,006 | 5 480 | 5,263 |
| Total DOE Weapons Employment* | 128 484 | 127,041 | 149,440 | 132 474 |

*Source: Department of Energy, Office of Industrial Relations, "Contractor Employment Summary Report by Contractor Classification" U S DOE 1986,1988 1992, and 1994 reports*

**Totals of subcategories do not add exactly to Total DOE Weapons Employment. One should note that the privatization of two uranium enrichment facilities in 1994 explains most of the decline in source and special materials employment between 1992 and 1994*

Employment at the public, non-profit, and private R&D facilities in the complex had expanded by 5,000 over the 1986-92 period, with a slight fall off in 1994. Overall, however, most new employment growth has been related to the weapons disposal and environmental activities. Between 1986 and 1992 there was also an increase of 11,000 employees in the nuclear materials production area, but the privatization of two uranium enrichment facilities in 1993-94 has led to a subsequent decrease by a few thousand jobs. Nonetheless, overall employment in materials production has grown from 1986 levels, with many of these new jobs going to the Savannah River facility in South Carolina. New activities in the waste cleanup area accounted for many of these new hires but employment was also created by the refurbishing of the tritium production facilities at the Savannah River site. New spending, again mostly related to cleanup activities, has stimulated new employment throughout the complex in support and maintenance and new construction activities.

Some of these new environmental and waste cleanup projects are occurring at different sites and locations than those where weapons were produced. It appears, however, that the cleanup task is so large that many workers displaced from weapons production plants are finding employment in environmental projects at the same location. This is certainly true at the Hanford nuclear reservation in Washington state.

Payrolls at weapons production facilities were cut by 2,400, but overall employment at the contractors in and around Hanford actually increased due to new cleanup activity. Most of the technical and blue collar workforce involved in weapons production were retrained and redeployed into these new activities [7].

All of these trends may be significantly altered by the restructuring of the DOE's weapons-related activities, especially if the administration and the Congress opt for a vigorous "nuclear stewardship" program. Policy analyses by the Congressional Budget Office show that a major expansion of the nuclear stewardship program will impose budgetary trade-offs on other operations, especially nuclear cleanup and the conversion-related technology transfer programs [1]. The biggest hit would come from reduced environmental cleanup operations, but the reduction in funding for the Cooperative Research and Development Agreements (CRADAS), which have funded various conversion-related technology transfers and spin-offs from the labs' weapons research, would be significant. Indeed, the labs have really only spent about 10% of their research budgets on technology transfers. Thus, curtailment of this program means a reversal of a very modest conversion effort and a remilitarization of the DOE's weapons labs.

## The Opportunity Costs

With the gradual disengagement of the U.S. nuclear weapons complex from its Cold War missions, the nation faces major decisions about how to reallocate its scientific and budgetary resources. Some have argued that the country can ill afford to continue spending billions on nuclear weapons research and, instead, would improve its security by expanding funding for environmental restoration, non-proliferation, alternative energy, and other environmental research [8]. Furthermore, there are those who suggest that these alternative priorities might be better carried out by other laboratories, universities, and non-profit research centers, rather than having the nuclear weapons labs transfer their resources to such efforts. Instead, it is suggested that the weapons labs could focus on cleaning up the environmental legacy of the nuclear arms race and on expanded non-proliferation efforts. Others are more sanguine about the prospects of a far-reaching conversion of the design labs to relevant civilian work.

By contrast, there are those in Congress who are calling for an expanded nuclear weapons research program -- one that does not necessarily involve renewed testing, but that will enable the U.S. to maintain the reliability, security, and superiority of its nuclear weaponry. Such an approach would involve investing in new equipment such as the National Ignition Facility to be built at Lawrence Livermore National Lab, which would advance the study of nuclear fusion and nuclear weaponry design. In addition,

while this alternative would require some consolidation of nuclear weapons design operations at both Los Alamos and Lawrence Livermore, it would also imply major new capital investments by the federal government in weapons-related research. All of this would imply trade-offs within the DOE's already severely constrained budget.

Finally, there are proposals being floated that the Defense Department take over the nuclear weapons design labs and other crucial weapons facilities, with the balance of DOE's work to be redistributed among other agencies. Clearly, such major decisions ought to be more widely debated by the public at large, especially since they will affect how the nation defines its future security and environmental quality.Thus far these discussions have largely been undertaken within the confines of the bureaucracy. But the citizenry should be informed about what the options are and what public benefits might be foregone before a decision is made. ❧

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