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paper⁹

An Overview of Defense Conversion in the Ukraine

by
Stacy Larsen

June 1997

Stacy Larsen is currently completing her Master's degree in International Policy Studies at the Monterey Institute of International Studies. She conducted the research for this paper while interning at BICC.

Copy editor: **Robert Mann**

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I. SUMMARY

It has become widely recognized that defense conversion is not merely a theory, but a practical policy instrument and process requiring planning and management. Accordingly, practical guidelines for implementing successful conversion policies are necessary, and this study seeks to support that aim by examining how conversion is played out in a single country—Ukraine. The paper reviews and analyses the data available on defense conversion in Ukraine across the six issue areas identified by BICC: reallocation of financial resources, reorientation of military research and development (R&D), defense industry restructuring, demobilization and reintegration of personnel employed by the armed forces, reallocation of military bases and installations, and alternative use and scrapping of surplus weapons.

Ukrainian military expenditures present a data collection challenge due to the lack of reliable national statistics, currency volatility, general economic instability, and the particular sensitivity of defense-related information. Data collection and analysis in this area is likely to be difficult until the Ukrainian Ministry of Defense is more forthcoming in its release of data to both Ukrainian and foreign governments.

The size and scope of Ukraine's military research and development expertise was commensurate with its large share of the Soviet Union's military-industrial complex. Several bi- and multilateral cooperative programs have been established to assist in utilizing this potential for civilian purposes and to prevent 'brain drain' to potentially unstable countries. In most cases, though the business and security interests of partner countries may be strongly represented, program goals include cooperation between Ukrainian researchers and Western institutes as well as the country's socioeconomic progress.

In the area of defense industry restructuring and conversion, Ukraine has been faced with the challenges of a system which was heavily dependent upon Russian arms production facilities. A number of joint ventures and partnerships have been formed with Western governments and firms to promote civilian production and the majority of these efforts are found in sectors which were formerly concerned with strategic missile, aviation, and space technology. Though the government has been described as hesitant in either fully committing to defense conversion or pursuing the arms market, the country appears to be favoring an increase in arms production and exports.

Demobilization in Ukraine is occurring at the same time as overall demilitarization and market economy transition. Troops have been steadily reduced since 1992, though reports on specific numbers have varied and reductions have come about largely by default rather than policy. The government cannot afford to maintain its military personnel, but it also lacks adequate resources to provide them with pensions, housing, and social services. At least one program has been established to address the retraining needs of Ukraine's demobilized, and though those requiring services may exceed its current capabilities, success has been demonstrated in the number of program participants as well as job placement rates. Housing projects for demobilized personnel and their families have also been established by Germany and the United States.

Military downsizing, demobilization, and the emergence of Ukraine as a non-nuclear state have left many military installations vacant or soon to be abandoned. Though the government has adopted policies which release military property for civilian purposes, there are significant financial and logistical challenges to successful reuse. Environmental cleanup alone will require substantial sums of money and specific information on military installations is scarce. Though the Black Sea Fleet, Crimea region, and former nuclear missile installations have received attention from both Ukrainian and foreign officials, and a feasibility study was conducted on the Khmelnytsky facilities by the US Department of Defense, there has been little activity in this area.

Despite its current status as a non-nuclear state and implementation of CFE Treaty requirements, surplus weapons are and will continue to be available in large quantities in Ukraine, providing a source of revenue as well as posing environmental and internal security hazards. Illegal sale of surplus weapons by members of the armed forces and acquisition by organized crime groups can pose a significant threat to internal and regional stability, while both legal and unauthorized weapons scrapping has provided a source of employment and capital. Though some joint ventures have been established to address surplus weapons destruction, the desire to increase its revenues and expand its share of the arms market has compelled Ukraine to sell a wide variety of its conventional weapons surplus through both governmental and unauthorized channels.

The role of external assistance in promoting defense conversion policies is assessed in the above areas and questions for further research are suggested. The study concludes with an



overview of the synergies between the issue areas, including direct links and some implications for various conversion outcomes.

II. INTRODUCTION

The scope and rapidity of international demilitarization following the end of the cold war is self-evident and undisputed. Declining defense budgets and arms exports, mass demobilization, worldwide base closures and the emergence of massive amounts of excess military hardware point up the fact that conversion is not merely a theoretical approach to a world no longer faced with a bipolar balance of power. It is instead a practical policy imperative with implications in industrialized as well as developing nations. The 1994 Human Development Report devoted an entire chapter to disarmament, demobilization, and how the “peace dividend” could be used for social development purposes. The United Nations has declared that both economic and social advances in the developing world have been “beggared for military power” (UN, 1991) and it has been demonstrated that living standards in the United States declined while large debts were accrued in pursuit of “economically non-contributive military activity” (Dumas, 1995, 9-10). The global reversal of such trends holds great promise for social and economic development worldwide.

Though data are available on each of the six conversion areas in a variety of countries, no study has been done to explore how conversion is manifested across the six areas in a single country or how the areas may be related. Such a study allows the development of conditioned generalizations or theories as to how conversion plays out in each area, contributing to our knowledge of its impacts and how well the theories fit the practice. Comparing and contrasting the management of conversion in each of the six areas may provide the opportunity to determine any relation between activity in one and progress in another. Such a study also allows an examination of the role that external assistance plays in conversion and illuminates conversion priorities by comparing the means, extent, and area of assistance chosen by the administering countries. This is particularly important in a country such as Ukraine, undergoing a process of economic transition with limited financial resources, as the extent and duration of the assistance may be critical in terms of the continuity and consistency of conversion programs.

Ukraine is a highly suitable focus for such a study. Most importantly, data are available in and relevant across all six issue areas, which is not the case in every country. During the Cold War, for example, OECD countries and the Soviet Union were responsible for 95-98 percent of

military R&D worldwide (Brzoska and Lock, 1988). For this reason, the issue of conversion in Africa is concerned far more with demobilization and reintegration; industry restructuring and R&D are less pertinent issues. Countries with large weapons surpluses may confront little in the way of base closures. Ukraine faces considerable challenges in each of the six conversion areas. The country contributed substantially to the military strength of the Soviet Union: it had a well-developed military-industrial complex, extensive R&D facilities employing numerous scientists, a variety of strategically critical military installations, and a large amount of troops and military hardware. The cessation of, or dramatic reduction in each of these areas provides great potential for creative and beneficial civilian endeavors and presents a formidable task to those who would implement them. Conversion activities and opportunities in Ukraine have also been overshadowed by those of its neighboring Russia and by the final withdrawal of nuclear weapons earlier this year. Unlike Russia, Ukraine provides a more manageable subject for study. Though data are available across all six areas, it is not so extensive as to be overwhelming. This affords the ability to outline what policies and programs have been implemented and allows analysis and discussion of the framework in which they are occurring.

Conversion is underway in Ukraine, with greater success in some issue areas than in others, and varying forms and degrees of external assistance. This paper seeks to detail the efforts being made in Ukraine in each of the six areas, the obstacles those efforts face, and the information which is lacking in order to inform further research and progress in each area. Given Ukraine's tenuous economic position, the nature of external assistance may be critical in terms of a conversion program's future development, and its role in promoting conversion will therefore be analyzed. Finally, interaction between the issue areas will also be discussed in an effort to determine to what extent they are interrelated and if activity in one area impacts developments in another.

III. AREA ONE: REALLOCATION OF FINANCIAL RESOURCES

When discussing reductions in military expenditures vis-à-vis the ‘peace dividend,’ it is important to make a distinction between direct budget savings, the alternative use of resources, and the future impact that resource reallocation may have. This is particularly important in a country such as Ukraine, where economic restructuring and instability have incurred costs that exceed the savings of cuts in the defense budget. This is most clearly illustrated by thinking of the peace dividend as taking three forms, or moving through three stages: the resource peace dividend, the product peace dividend, and the welfare peace dividend.

- The resource dividend: *the savings resulting from reduced military spending*
- The product dividend: *the sum of the various alternative uses to which the savings are allocated*
- The welfare dividend: *the positive welfare effects resulting from resources released from the military* (BICC, 1996)

Direct budget savings represent the resource dividend, and in the case of Ukraine, it is easy to consider these resources lost, consumed by the costs of economic transition. Rather, the resource dividend allows alternative uses of released funds (the product dividend) which in turn may have significant social and economic impact in the long term as budget deficits and the military burden is reduced and further resources are available for use in other sectors of the economy. It is in this welfare peace dividend that the benefits of military spending reductions are most clearly seen, though a broad and long-term perspective is needed to retain that vision. Welfare effects are not immediately evident in most cases, nor easily measured. In contracting or restructuring economies, even more time may be necessary before positive welfare outcomes are apparent.

Ukrainian military expenditures present a data collection challenge due to the lack of reliable national statistics, the country’s general economic instability, and the sensitivity of defense-related information in particular. High inflation and changes in national currency present further difficulties. For example, military expenditures data from 1991 to 1993 are available in rubles, from then on in karbovanets. The fluctuating and volatile karbovanets can hinder

correct and consistent assessment of budget figures and it is not always possible to correctly calculate defense expenditures either in constant US dollars or as a percentage of GDP. The introduction of Ukraine's national currency—the hryvna—and its future stability may also affect how accurately military spending can be calculated and monitored.

TABLE 1: UKRAINIAN DEFENSE EXPENDITURES

1991	7.0
1992	112.2
1993	541.1*
1994	21,597.3
1995	106,200-120,000 (US \$700-800 million)
1996	137, 962 (US Embassy Kiev)

*Figures for 1991-1993 are in billion rubles, from 1994 onwards in billion karbovanets. 1995 figures are a budget figure, taken from *Golos Ukrainy*, 21 April 1995 and an estimate by the *Financial Times*, 24 March 1995. (SIPRI, 1996 unless otherwise noted.)

Though there have been annual reductions in the amount of money allocated to military spending, this can be seen more as a reflection of the weak Ukrainian economy and chronic shortage of financial resources rather than a policy decision. The defense establishment has consistently requested more funds for the defense budget than the Supreme Rada has been willing to adopt. In February 1994, for example, only about ten percent of the US \$1.8 billion requested by the Ministry of Defense was actually allocated. In 1995, the defense budget was also well below the requested amount, and insufficient to cover pensions, salaries and even basic supplies. Overall expenditure was cut by four percent, with the largest reductions made in the armed forces. Total defense expenditure for 1995 was to be only US \$757 million (106 trillion karbovanets) or only 4.3 percent of the total budget. According to the defense minister, the 1995 budget was too small to allow for “even elementary modernization of weapons and equipment” and with basic maintenance already a challenge, development of the armed forces is out of the question. Military personnel were reduced by 65,000 due to lack of funds, and the sale of military installations and land was proposed as a means to supplement the insufficient budget (Kuzio, 1995).

As defense budget allocations have been falling below the requested amounts for several years, the military is increasingly unable to meet even the most basic personnel needs. Whereas in 1992 the military was able to meet 34 percent of its expected costs, the 1995 budget met only

17 percent of funding needs (*Financial Times*, 24 March 1995). Ironically, efforts at demilitarization—particularly in the area of troop demobilization and retraining—are hampered by reductions in military spending, as retirement benefits, housing, and the employment and social reintegration of military personnel all require additional spending. These problems are likely to continue, as the Ukrainian Ministry of Foreign Affairs has noted that the most recent budget is also insufficient to cover necessary costs. Ukrainian Armed Forces expenditures for 1996 total 137,962 billion karbovanets, or about US \$727 million. The ratio of defense spending as percent of GDP dropped from 2.6 in 1995 to 1.93. Defense spending as percentage of total budget expenditure stands at 4.83, nearly the same as in the previous year (US Embassy Kiev, July 1996). But as Ukraine further downsizes its military, housing is still lacking for about 70,000 personnel, and the costs of maintaining or modernizing equipment, as well as those of disarmament, exceed the current budget (Loose-Weintraub, 1996).

It is likely that data reliability will continue to be a challenge in this area. The Ukrainian government is generally hesitant to make much information public, a situation that does not seem likely to change in the near future. Ukraine's new national currency was only recently introduced; the accuracy of future data in constant dollar figures may depend as much on its fluctuation as it did on that of the karbovanets. Also lacking are data on itemized defense budget expenditures. Though available data provides some idea as to the discrepancies between funds requested by the Ministry of Defense and those allocated by the Supreme Rada, specific information is unavailable. The US Embassy has commented that MoD officials have refused to provide information regarding the budgets of the separate armed forces branches if they fall outside of CFE jurisdiction. Their unwillingness to provide information has extended to the Ukrainian parliament and the defense, national security, budget, and finance commissions particularly at times of budget assessment (US Embassy Kiev, 1996). Data collection and analysis in this area is likely to be difficult until the Ministry of Defense is more forthcoming, to both Ukrainian and foreign governments.

IV. AREA TWO: REORIENTATION OF MILITARY RESEARCH AND DEVELOPMENT—COOPERATION AND INVESTMENT IN UKRAINE’S SOCIOECONOMIC FUTURE

1. Military R&D in Ukraine

The scope of Ukraine’s military research and development expertise was commensurate with its large share—about 25 percent—of the Soviet Union’s military industrial complex. Though it is difficult to determine the total number of scientists, researchers and technicians who were engaged in defense work, the number of research and design facilities exceeded 300 (US Embassy Kiev, 26 May 1995). The shipbuilding sector employed 10,000 personnel in 33 research and development bureaus (US Embassy Kiev, 14 March 1996), and the design bureau of the Yuzhmash missile factory alone employed 5,000 (US Embassy Kiev, 12 June 1995). The declining military budget, loss of the Soviet weapons market, and subsequent crisis of Ukraine’s military industrial complex have considerably reduced demand for the talents of Ukrainian military R&D professionals. This affords them the opportunity to improve the quality of life in Ukraine by directing their expertise towards peaceful means or to assist other countries in weapons development. The objective of current R&D conversion programs in Ukraine is to discourage the second by facilitating the first.

2. R&D Conversion Programs in Ukraine

2.1 Science and Technology Center of Ukraine (STCU)¹

The STCU—the first intergovernmental organization in Ukraine—was established by agreement between Ukraine, Canada, Sweden and the United States in October 1993. The European Union and Japan have recently indicated their intentions to contribute to the project as well. Headquartered in Kiev, it began its operations in December 1995 with the objective of retaining the expertise of those scientists formerly engaged in military research and

¹ Information on the STCU is based on a presentation given by Mr. Ostap Hawaleshka, STCU Director, at the Conference on Dismantlement and Destruction of Nuclear, Chemical and Conventional Weapons. 19-21 May. Bonn, Germany.



development, facilitating economic transition, and preventing ‘brain drain’ to potentially unstable countries. The STCU mission is:

To support R&D activities by Ukrainian scientists and engineers, formerly involved with weapons of mass destruction and their means of delivery, as part of the general process of conversion from a largely centralized planning military to a civilian, market-driven competitive environment, more useful for Ukraine.

Proposals are solicited from the Ukrainian scientific community for research, development and production technology prototyping and then submitted to a review committee following clearance by Ukrainian Security and Export Control. The proposals are all based on former military work, but directed towards peaceful uses. Projects are intended to contribute to the professional development of former weapons researchers as well as facilitate the socioeconomic progress of Ukraine. For example, though donor countries have first negotiation and use rights for the use of intellectual property developed under STCU projects, that property remains with the Ukrainian researchers, and the Center encourages entrepreneurial enterprises based on project outputs. The STCU aims to reorient the expertise of former weapons scientists by supporting their research financially, while assisting them in the transition to a more market-oriented work ethic. The Center also encourages cooperation between Ukrainian researchers and institutes with those in the West, with the hope of facilitating access to the world scientific and industrial community. The center is also making a particular effort to maximize the participation of Ukrainian women scientists in its projects.

As the second largest source of R&D funds in Ukraine (after those establishments under the administration of the National Academy of Sciences) the STCU has been successful in laying the groundwork for achieving its goals. To date, the STCU Board has approved and is funding fifty high technology Ukrainian R&D projects. The rate of approval for the first round of reviewed proposals was 40 percent, and increased to 60 percent for the second group of projects. Nearly one thousand Ukrainian scientists who were once occupied with weapons development are now directly supported through STCU projects.

Research supported through the STCU is being conducted at numerous institutions, including the Pivdenne (Yuzhnoye) Design Bureau, the Kharkiv Institute of Physics and Technology and Kharkiv State University, the Institute of Technical Mechanics in Dnipopetrovsk, and the Institute of Nuclear Research. STCU-sponsored projects span the following areas:

• Plasma sterilization	• Nuclear safety
• Composite materials	• Basic nuclear physics and cosmology
• Pharmaceutical and food additives	• Information infrastructure
• Artistic laser engraving	• Medical instruments
• Environmental modeling and monitoring	• Risk assessment for Chernobyl
• Conventional and advanced vehicle propulsion	• Solar energy

Source: STCU Board Meeting, 1996

2.2 Civilian Research and Development Foundation (CRDF)

The CRDF, founded 11 August 1995, is intended to provide scientists and engineers in the former Soviet Union with civilian research and development opportunities, offering an alternative to emigration by allowing them to work collaboratively with US and other FSU professionals. The CRDF was initially funded by a US \$5 million Nunn-Lugar allocation which was then matched by an additional US \$5 million from George Soros to the US National Science Foundation. While the primary goal of the program is to encourage civilian R&D efforts and prevent brain drain, the organization also seeks to strengthen the emerging market economies of the FSU by funding joint R&D ventures between US and FSU businesses, scientists, engineers and entrepreneurs. This process is intended to promote greater understanding of commercial business practices; increase mutually beneficial trade opportunities, and thus revitalize Ukrainian industry by basing production on non-military goods and advanced scientific and technological research (CRDF Homepage, 1996).

In September 1996, the CRDF announced the first awards in its Cooperative Grants Competition. The proposals of 51 Ukrainian scientists paired with US co-investigators were approved. Projects include:

- Developing Sorbants and Inorganic Ion Exchangers for Nuclear Waste Remediation and to Remove Radionuclides from Humans and Animals
- Improvement of High-Temperature Superconductor Technology by Conversion of Defense Plasma Guns
- Searching the Substellar Masses in Other Galaxies through Monitoring of Gravitational Lenses
- Non-Linear Effects in Irradiated Materials
- Processing and Analysis of Historical and Contemporary Sea Color Satellite Data for Diagnosis of the Ecological State of the Northwest Black Sea
- Development of Methods of Ground Control Over Abandoned Mined Lands
- Research and Development of New Electrochemical Materials for Chemical Power Sources (CRDF Homepage, 1996)

2.3 International Association for the Promotion of Cooperation with Scientists from the New Independent States of the Former Soviet Union (INTAS)²

In 1995 the Ukrainian authorities and INTAS agreed to co-organize and jointly fund a call for submission of scientific research proposals for research projects of up to two years. Funding for INTAS projects includes 3.6 million ECU (US \$4.2 million) allocated to these projects by the EC, and that amount will be matched by the Ukrainian government. As INTAS does not investigate the backgrounds of each participant, the level of involvement by former weapons scientists and engineers in INTAS-sponsored programs cannot be precisely determined. But, from the high number of scientists in Ukraine that were engaged in military research, and the nature of the scientific expertise represented by many INTAS candidates and approved proposals, it is likely that a significant number of them were formerly involved in defense-related research. Physicists, for example, are heavily represented among the participants. Further, INTAS-sponsored research is explicitly non-military. The goals of the Ukraine-INTAS program are collaborative research between research teams from Ukraine, member states of the INTAS General Assembly, and other NIS countries and projects that are mutually

² The INTAS General Assembly includes Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, The Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

beneficial to all parties involved. The deadline for proposals was 31 January 1996, by which time 316 proposals had been received.

Box 1: Breakdown of INTAS proposals received and approved within the eligible scientific areas			
	Received	Approved	Percent of total approved
Chemistry	9	2	3 %
Life Sciences	73	15	23.3%
Earth Sciences, Environment, Energy and Agriculture	186	37	59.4%
Economics, Social and Human Sciences	45	11	14.3%

Source: Schubert, 1996

Sixty-four projects were finalized, with the majority of them in the Earth Sciences, Environment, Energy and Agriculture Sectors. Among the approved projects are work on the decontamination of soils and removal of heavy metals and radioactive material and a study of industrial restructuring during economic transition with a special emphasis on the eastern region of Ukraine.

Projects were scheduled to begin from August 1996 on. Of the NIS research participants, only 8% are non-Ukrainian. A member of the INTAS General Assembly has stated that among the benefits of the INTAS program is that it serves as a model for former Soviet researchers and institutions of the design and implementation of cooperative research efforts from the application stage to project completion. One drawback of such a bilateral (INTAS-Ukraine) call is that so few other NIS representatives are involved in the current round of projects, and the hope was for as much transnational collaboration as possible (Schubert, 1996). Nonetheless, like the STCU, the INTAS program sets an important example of Ukrainian scientific expertise remaining in Ukraine and being used in a collaborative fashion for non-military purposes that may inform future attempts to reorient R&D.

3. The Role of External Assistance

Conversion efforts in the area of military research and development are represented by bi- and multilateral cooperative programs and there seems to be little activity that is not sponsored by

external actors. Efforts in the area of R&D conversion without some organized form of outside assistance or investment seem to have stagnated, specifically in the case of the Yuzhnoye Design Bureau. Though at least one STCU project is being conducted there, the bureau has lost a number of its personnel, primarily to the United States and Israel (Moltz, 1996). The main contributors to R&D conversion programs are the United States, Canada, and Sweden in support of the STCU, the United States in support of the CRDF, and the European Community in support of the INTAS programs. Though this can be seen as a reflection of Ukraine's inability to fund such efforts independently, the business and security interests of the nations involved in sponsoring R&D conversion programs are strongly represented.

Countries providing assistance have clearly recognized the level of expertise in the Ukrainian R&D community and weighed its potential benefits and disadvantages. A common priority among current programs is to maintain the presence of Ukrainian R&D talent in Ukraine and use its potential for activities which will benefit the country socioeconomically rather than lose them to countries where their expertise may threaten regional or even international security. The STCU explicitly states that the goals of the program reflect "the hope of Western countries that Ukraine keep its considerable pool of talented scientists in Ukraine, rather than have them leave to other countries, possibly to those where their presence may not be particularly desirable" (Hawaleshka, 1996). CRDF interests include offering "alternatives to emigration" and providing "opportunities to develop mutually beneficial trade. . .based on the products of advanced scientific and technological research" (CRDF, 1996). Though INTAS does not specifically address brain drain as a concern, it does emphasize non-military research. The focus is on scientific cooperation between Ukraine and INTAS-member countries without political or commercial application and all projects "must be of mutual benefit for all participants" (INTAS, 1996).

4. Questions for Further Research

4.1 The Extent of 'Brain Drain'

Though some scientists formerly involved in military R&D have reportedly emigrated to the United States and Israel, the extent of such emigration from Ukraine is not known, particularly to potentially unstable countries. How real is the threat of expertise formerly applied to Soviet

weapons of mass destruction being used in nations that could endanger regional or national stability?

4.2 R&D Conversion in Conventional Weapons Technologies

The R&D conversion programs described above place a high priority on providing constructive alternatives to members of the Ukrainian scientific community who were formerly involved with weapons of mass destruction. What is the role of conventional weapons R&D conversion? Though the professionals involved in such research may pose much less of a security threat, can their talents also be applied to peaceful, constructive ends? Is it perhaps easier to reorient their expertise than that of the scientists involved with mass-destruction technologies? Do their talents have greater civilian application?

V. AREA THREE: UKRAINE'S MILITARY-INDUSTRIAL COMPLEX: CONVERSION OR ARMS MARKET DEVELOPMENT?

1. The Arms Industry in Ukraine

Military production once accounted for a staggering percentage of Ukraine's economic activity. At the time it gained independence, Ukraine inherited approximately 25 percent of the former Soviet Union's military-industrial complex (US Embassy Kiev, 1995). About 1,840 defense enterprises employed 2.7 million people—nearly 40 percent of the total working population—and represented one-third of GNP (Bodruk, 1994; FBIS, 19 March 1996). Of these enterprises, 700 produced exclusively for the military market, the remainder were indirectly involved in defense production and the output of both included communications equipment, combat and transport aircraft, tanks, aircraft carriers, missiles, and satellites (Markus, 1996). The military-industrial complex was regionally concentrated in the eastern and southern parts of Ukraine, which have higher Russian or pro-Russian populations: the eastern Kharkov, Lugansk, and Dnepropetrovsk oblasts accounted for 18 percent of the defense industry labor force, Nikolaev oblast in the south for 25.5 percent and Kiev and its oblast for 17.5 per cent (Jane's Intelligence Review, 1994). By 1995, military production had declined to only one-tenth of the 1991 level, a greater decline than in Russia, and of the 700 direct defense enterprises operative at that time, only about 100 were still producing (SIPRI, 1996; *OMRI Daily Digest* 27 October 1995). This dramatic drop in production has been labeled 'landslide conversion' (Petrov, 1995, Antonov, 1994).

Defense production in Ukraine had particular distinctions which have encumbered a smooth transition to civilian production and restructuring of the arms industry, principally the country's economic dependence on supplies of raw material and energy and the lack of a full-cycle arms production system. Between 1970 and 1994, Ukraine's ability to meet its own needs for fuel and energy supplies fell from 100 to only 25 percent (Bodruk, 1994). This, combined with Ukrainian dependence on Russian arms production facilities, limits the country's independent industrial capacities. Ukraine's military industrial complex, though technologically advanced, was not a closed production system. Most large weapons producers were closely integrated with and thus heavily dependent upon Russian production facilities and resources. While

Ukraine produced nearly 25 percent of Soviet military goods, about 80 percent of the industry depended on Russia to provide many of the components necessary to complete weapons production (Markus, 1996). Missiles produced in Dnepopetrovsk, for example, required Russian engines; tanks such as the T-64, T-72 and T-80, though produced in Kharkiv, were fitted with Russian-made armor and guns; the shipyards in Nikolaev built ships according to designs provided by Russian bureaus (Kuzio, 1994).

Without ready access to necessary components or its former markets following independence from the Soviet Union, the Ukrainian defense industry could not maintain its past levels of production and the country was faced with pursuing conversion of the weapons industry or the world arms market. In 1994, Victor Antonov, former Minister of Defense Conversion, identified three possible conversion paths in Ukraine which reflect the country's predicament of how to best strengthen its economy through defense industry management:

The first involves a broad conversion, and is preferable. This requires using converted capacities for the production of civilian products needed by the national economy. Long-term credits by Ukrainian banks and foreign investors for technical reequipment and reconstruction of enterprises would guarantee enormous profits. Although this would happen after some time . . . there has not been much investment to date. This option is more civilized and corresponds to the non-violent policy of our state. The second conversion option . . . calls for the continuous sale of military hardware. In other words, to maintain the MIC's size, allowing Ukraine not only to meet the needs of the national armed forces, but also to export certain types of weapons and equipment to CIS countries and to traditional world markets. Funds used from the sale would be used for conversion, as well as the social security of workers. There is also a third possibility, the so-called shock conversion, which calls for the reorientation of defense industries to produce civilian items with minimum budgetary support from the state. This option is fraught with unreimbursable losses in intellectual and technical-industrial potential . . . and is the least appealing. (Antonov, 1994)

The circumstances of the Yuzhmash missile factory in Dnepopetrovsk provide a timely, microcosmic glimpse into the conversion dilemma facing Ukraine's arms industry.

Box 2: The Yuzhmash Missile Factory

The Yuzhnoe research production organization and the Yuzhmash manufacturing plant, also known as the Southern Machine Building Plant Association, is the largest integrated rocket design and production facility in the world and once produced some of the Soviet Union's most powerful strategic missile systems (Baker, 1996). Its technological advancement and long history have made it a point of national pride—President Leonid Kuchma was head of the facility for several years—and the residents of Dnepropetrovsk depend heavily on the plant for their livelihood. Though 50,000 people were once employed on the production side of the plant, and that figure has since dropped to about 30,000 to 34,000 (Baker 1996), the plant's closure would clearly be an economic disaster. The plant has been producing non-military goods such as space boosters, trolleybuses, and washing machines, but financial strain has led to reports that the plant is seeking arms and technology transfer arrangements with China and Iraq as well as technology development and conversion options—specifically the development of a missile with a range of up to 500 kilometers and use of military missiles as space launchers—that are not supported by proponents of the MTCR [Missile Technology Control Regime] (Baker, 1996). Thus, Ukraine finds itself with the ability to address an enormous economic burden by taking advantage of its technological capabilities and generating export revenue but consequently spurning the non-proliferation agendas of western powers that may attach adherence to agreements such as the MTCR as preconditions for assistance and access to key markets.

Shortly following Ukrainian independence, the Ministry of Defense Conversion was established and in November of 1992, the State Program on the Conversion of Military Production was developed to help stabilize the effects of landslide conversion—unemployment and economic recession. Their findings indicated that conversion of just 324 plants and scientific organizations would require retraining 400,000 employees and result in production declines of 70 to 80 percent (Antonov, 1994). In response to this grim situation, the Ministry of Defense Conversion and the Cabinet of Ministers undertook several financial assistance measures to preserve the production potential of Ukraine's major enterprises, including the adoption of the State Foundation of Promotion of Conversion designed to fund conversion in the defense and engineering sectors (Antonov, 1994). Early conversion efforts included production of trolleybuses at the Yuzhmash missile factory, construction of oil tanks and refrigerators at the Nikolaev shipyards, and production of medical equipment and gas meters at former missile enterprises in Kiev (Petrov, 1995). Despite government measures at propping up the defense industry, it became clear that budget deficits, inflation, unstable prices and the financial crises facing defense industries called for external assistance in the form of foreign investment, which,

due to the slow pace of economic reform under President Kravchuk, did not accelerate until the election of Leonid Kuchma in 1994.

In 1995, the Ukrainian Ministry of Defense Conversion identified the following priority sectors (not listed in particular order of preference):

- Energy conservation equipment (US Embassy Kiev, 1995)
- Microelectronics
- Consumer goods
- Radio-electronic equipment
- Instrumentation
- Communication and information technologies
- Heavy machine-building
- Machine tools and other tools
- Transportation equipment
- Construction industry equipment
- Electro-technical industry
- Aviation industry/aerospace
- Shipbuilding
- Environment monitoring equipment
- Mining
- Engine production
- Automobile manufacturing
- Computer technology
- Agriculture and food processing equipment
- Medical industry and Chernobyl cleanup

Kuchma's election and his commitment to transforming Ukraine into a Western-style democracy and market economy brought a wave of interest from international financial institutions and Western governments which paved the way for greater foreign assistance and investment (Kuzio, 1995). While his emphasis on such economic reforms as privatization and active pursuit of foreign partnerships contributed significantly to the increase in investment, his

most effective measures were most likely normalizing relations with the West and ratification of the NPT. As John Jaworsky has pointed out, “the possibility of Western investment in Ukraine has increased now that nuclear disarmament measures are proceeding, and Ukraine has pledged to abide by recognized treaties to limit ballistic and nuclear missile proliferation” (Jaworsky, 1995, p. 59).

The US government in particular has promoted investment in Ukrainian defense conversion. The Department of Commerce and Bureau of Export Administration (BXA) have produced guides to defense conversion investment in 1994 and again in 1996 and the SABIT Defense Conversion Training program facilitates an exchange program for defense industry professionals. The most recent BXA publication, “Investment Opportunities in Ukrainian Defense Conversion,” provides profiles of 92 enterprises seeking investment partnerships. The profiles include the specific military focus of the enterprises, technologies used, number of employees, principle officers, military and civilian production lines, existing or planned conversion projects, and contact information. The guide is intended to “facilitate commercial contacts” for the United States business community (US Department of Commerce, 1996) and over half of the enterprises profiled claim to have conversion efforts planned or currently underway, many of which involve industrial partnerships in production or use of imported equipment. Projects include:

- A joint venture between the Zhaliv Butomy shipyard and the Pepsi Company to convert the plant from naval to civil vessels and an agreement with PepsiCo International to convert part of the shipyard for construction of prefabricated pizza restaurants.
- A joint venture between the former Khartron missile and space control systems plant and a Chinese firm to assemble television sets.
- Polish-Ukrainian cooperation in production of complex medical equipment.
- Production of a digital electronic dialing system by the Kiev Korolev Radioprylad plant which produced radar equipment and devices for measuring nuclear radiation and Siemens AG of Germany.
- German-Ukrainian cooperation in production of nuclear magnetic resonance tomographic machines.
- Production of gas-flow meters using French equipment.

- Construction by the Okean shipyard of ore carriers for Norway and refrigerator ships for France.
- A joint venture between the Fregat Machine Building Plant and the Bill Harbort Company of the United States to build housing modules for decommissioned Strategic Rocket Forces in Pervomaysk.

Conversion efforts with the highest profile and level of foreign investment to date are found in sectors which were formerly concerned with strategic missile, aviation and aerospace technology. The Kuchma administration has also focused on these sectors—as well as the shipbuilding industry—as recipients of government support (*OMRI Daily Digest*, 30 June 1995). These were the critical sectors in the Soviet Union's defense complex (FBIS-SOV-95-049, 14 March 1995) and they have been the most attractive to foreign investment, as evidenced by the joint ventures funded by the US Department of Defense and others.

Box 3: DoD-Sponsored Industrial Partnerships

Khartron-Westinghouse (Westron)— Westinghouse was allocated US \$5 million for a joint venture with Khartron, formerly a producer of strategic missile and space systems controls. The partnership plans production of state-of-the-art instrumentation and control systems to improve safety conditions in Ukrainian nuclear plants. Westinghouse is providing a total of US \$28.8 million in technology and capital and Khartron is contributing refurbished offices and facilities for management, engineering and production. The enterprise's first two contracts are already being executed and local production of I & C hardware was scheduled to begin by December 1996.

Kommunar-Federal Systems Group—Federal Systems Group was awarded a US \$3.25 million contract to begin a joint venture with the Kommunar Production Association, which formerly produced missile and space guidance and control systems as well as relays for military satellites. The enterprise will produce cellular phones at Kommunar's Kharkiv factory. Federal Systems Group will provide US \$1.15 million. Production began on 18 September 1995 and purchase commitments have already been made.

Monolit-ABB Combustion Engineering—ABB was awarded US \$4.8 million for production of digital instrumentation and control systems for nuclear power plants with Monolit, a former manufacturer of aircraft, spacecraft, and missile electrical, control, and guidance systems. ABB's technological and licensing contributions amount to US \$20 million.

Meridian-Die Casters—Die Casters Incorporated was awarded US \$3.03 million to form a joint venture with Meridian to convert the military electronic and radar facility to the manufacture of such die cast products as automotive parts and hand tools. The DCI

contribution is US \$1.07 million and equipment installation, sales and marketing was expected to begin in February 1996.

Orizon-American Industrial Development Corporation—The American Industrial Development Corporation was awarded US \$2.26 million for a joint venture with Orizon to convert a plant which formerly manufactured space navigation equipment to production of windows and doors.

Source: Office of the Secretary of Defense, January 1996.

1.1 Conversion Plans and Projects in the Aerospace, Aviation and Shipbuilding Sectors

Ukraine has sought satellite launch and aerospace cooperation contracts with the United States, Latin America, Russia, and India in an effort to preserve a sector that it cannot afford to subsidize independently. In 1995, an agreement between the United States and Ukraine on commercial space launches was signed which permits Ukraine, alone or in a joint venture with the US, to win as many as five contracts for launches on its own and 11 in a joint venture until 2001 (*OMRI Daily Digest*, 15 December 1995). Russian-Ukrainian military cooperation efforts were strengthened with the formation of International Air Engines, an industrial group aimed at building aircraft and selling arms and supply parts in the aerospace sector. (*Financial Times*, 20 February 1995). Other joint ventures have included a US-French-Russian project sending an unmanned flight to Mars at the end of 1996, Ukrainian use of a Brazilian launch site, and a rocket-booster launch from Plesetsk which carried Chilean and Ukrainian satellites (Markus, 1996). Ukraine is participating in the Sea Start sea-based missile complex, financed 20 percent each by Boeing and Norway's Cvarner, 25 percent by Russia's Energiya, and 15 percent by Ukraine's Pivdenmash [Yuzhmash] (Markus, *Jane's Intelligence Review*, 1996) and has also sought to promote Ukrainian-Indian cooperation in the aerospace industry, taking part in an industrial-trade exhibition featuring that sector (*OMRI Daily Digest*, 12 March 1996).

In the aviation industry, which has attracted little investment, Ukraine, Russia, and Kazakhstan are continuing to develop the AN-70 transport aircraft, designed to ship 30-35 tons of cargo at up to 750 kilometers per hour (Markus, 1996). The EBRD opened a credit line to Ukraine for US \$45 million to be used for aircraft projects in Zaporizhzhya, supplementing the government support offered to the aviation sector (*OMRI Daily Digest*, 24 July 1995). In shipbuilding, British Ukrainian Shipbuilders, encouraged by the success of a three-year old partnership between PepsiCo and the Zhaliv shipyard, plans to build bulk carriers, container ships, tankers

and general purpose ships by using Ukrainian shipyards for the initial construction and then fitting them with British equipment (*Financial Times*, 25 August 1995).

Box 4: Training in Defense Industry Conversion

Special American Business Internship Training Program (SABIT):
Defense Conversion Program

As of March 1996, 56 Ukrainians had participated in the US Commerce Department's SABIT program, spending one to three months with US firms in fields including defense conversion. The Defense Conversion Training Program, intended for mid- to senior-level business managers, includes two weeks of management training in Washington DC, and six weeks of training with a US company in the process of converting to civilian production. The goals of the program are to "facilitate the conversion of defense enterprises in the New Independent States (NIS) while developing long-term US-NIS business relations and enhancing US trade opportunities in the region." Partnerships arising out of the program include Raytheon and the Ukrainian Ministry of Defense, Hansen and Kommunar, and Alliant Techsystems and the Ukrainian Pavlograd Chemical Company (destruction of conventional and artillery munitions and solid fuel SS-24 missiles).

Source: SABIT Defense Conversion Program, US Department of Commerce, 1996; Office of the Coordinator of US Assistance to the NIS, 1996.

1.2 Obstacles to Conversion

Despite the projects and programs outlined above, the progress of conversion to civilian production in Ukraine has been assessed as "insignificant" (Markus, 1996) and "only partly successful" (*Financial Times*, 23 October 1996). Evaluations of Ukraine's progress vary considerably by source and sector. Ustina Markus has commented that there is "little chance of earning revenues" from the shipbuilding industry and that Ukraine's export potential in that sector are limited due to its inability to fully equip vessels (Markus, 1996), whereas reports on the same industry by the US Embassy in Kiev have emphasized its "vast technical potential" (US Embassy Kiev, 14 March 1996). The *Financial Times* has identified the shipbuilding and chemical industries as sectors with "a future in the free market" (*Financial Times*, 23 October 1996). Nonetheless, despite US aid for conversion projects and Kuchma's economic reforms, US Ambassador to Ukraine William Miller has stated that Ukraine's "investment climate" is not favorable to attracting the investment necessary for economic reform (*OMRI Daily Digest*, 27 October 1995). Success in converting to civilian production may depend heavily on access

to western markets and foreign investments, but Ukraine's taxes, customs, laws and land guarantees remain deterrents to potential US investors (*Financial Times*, 11 May 1995).

Among the other obstacles to successful performance of Ukraine's military-industrial complex are continued dependency on Russia for spare parts and equipment and a lack of experience on the part of Ukrainian arms producers in marketing their product (FBIS-UMA-96-080-S, 19 March 1996). Ukraine's arms export firms, Ukrimash and Progress, are not highly regarded in the arms trade, and have even been described as "incompetent" (*Financial Times*, 23 October 1996). Shipbuilding and aviation have been crippled by ongoing dependence on Russia for parts and components and though the aerospace industry has established partnerships with Russia as a means of maintaining its technological edge, it too has been forced to close facilities that can no longer be funded (Markus, 1996). President Kuchma has also suggested that Russia's early lack of cooperation on military technology and arms exports have exacerbated problems in converting Ukraine's military-industrial complex (FBIS-SOV-96-014, 22 January 1996).

It has been suggested that a major impediment to industrial conversion in Ukraine is a "policy of contradictions"—the government's inability or unwillingness to fully commit itself either to defense conversion or the arms market (Markus, 23 February 1996). As an example, Ukraine has been hesitant to privatize military industries, particularly those which produce sensitive and high tech components and systems, though it lacks the funding to subsidize them (Ibid.). Exacerbating the situation is the belief in Ukrainian military circles that the arms industry should be preserved in order to support domestic supply needs given that Ukraine cannot afford to import equipment (Ibid.). Further illustrating Ukraine's dilemma and encouraging the development of the arms industry is the notion that funds for defense conversion can be raised through international arms sales (Bodruk, 1994). If it is true that conversion cannot succeed if development of the arms trade remains a goal, then the outlook for Ukraine is discouraging, as recent reports indicate that the country is actively seeking to establish a niche in the international arms market.

1.3 Pursuing the Arms Market

The 1996 BICC Conversion Survey noted that the desire to develop a self-sufficient, complete production defense sector and the slow pace of reforms might compel Ukraine to pursue increased arms sales abroad and this seems to be proving true. Despite reluctance to privatize the military sector and the superiority of Russia's resources and marketing arrangements, industrial conversion efforts have recently slowed as the country seeks to produce weapons independently and build a reputation as an exporter of 'NATO-class' weapons through both state and private weapons manufacturing. Facilitating private production is an increase in privatization and government opposition to the privatization ban on 'strategic' state enterprises which was established last year by Ukraine's conservative parliament (Reuter News Service, 12 July 1996) As of April 1996, Ukrainian leaders, "recognizing the advantages of the arms trade. . . put a halt to large-scale conversion" and granted permission for 550 military-industrial enterprises to privatize and incorporate, retaining just 150 for state control (FBIS-UMA-96-085-S, 10 April 1996).

Ukraine is pursuing tank exports by continuing to develop and produce main battle tanks such as the T-64, T-80UD, and T-84 in government-owned enterprises, offering upgrade packages for T-72 MBTs (Foss, p. 18), and producing new models such as the recently developed T-90 Kern (FBIS-UMA-96-085-S, 10 April 1996). At the Malyshev tank plant—which has recently begun to produce rugs, pots and pans, as well as sugar mill and coal industry equipment—foreign orders of the T-84 main battle tank have been sought to preserve the plant's tank production. The T-84, demonstrated at the IDEX-95 weapons exhibition in Abu Dhabi, is distinguished from the Russian T-80 by being equipped with a diesel engine rather than a gas-turbine engine and though the Russian model expends one and half times more fuel, Russia has arranged mutually beneficial cooperative military agreements as well as repair bases and retraining centers for specialists which have given it a competitive edge (FBIS-UMA-95-206-S, 19 September 1995). Although Russia is still ahead of Ukraine in the arms trade, the country is currently enjoying a high demand for its weapons, based on their high quality and low price. Most of the specialists engaged in military research and production under the Soviet Union have remained in Ukraine and they are continuing to produce high-grade weapons which are being sold at rates twenty percent cheaper than anywhere else in the world (FBIS-UMA-96-085-S, 10 April 1996).

Ukraine's arms exports have not been limited to tanks. According to data submitted to the UN Register of Conventional Arms released on 3 October 1996, during 1995 Ukraine exported armored combat vehicles, combat aircraft, missiles and missile launchers in addition to tanks. Poland, the United States, Uganda, Yemen, Malaysia, Vietnam, and the Slovak Republic were the final destination points for a host of Ukrainian weapons in 1995, including 64 T-72B, T-72BK, T-55 and T55AD battle tanks, 6 BMP-2K infantry fighting vehicles, 2 BTC-4 tractors, 4 SU-22 combat aircraft, and 159 R27R air-to-air missiles (UN Register, 1996). Russia reportedly is ordering a number of armaments from Ukraine which it is unable to produce itself, including "missiles, parts for S-300 air defense systems, warships, and precision electronic systems" (FBIS-UMA-96-085-S 10 April 1996). The latest data indicates a trend toward increasing arms exports in response to a "nearly bankrupt military industrial complex" after the declines observed in the past four years (*Financial Times*, 23 October 1996). Though Ukraine still falls behind the United States, Britain, Russia, and perhaps even Israel and South Africa, Natalie Goldring of the British-American Security Information Council observes "Ukraine is moving into the big time" (*Financial Times*, 23 October 1996).

Disturbing questions arise as to just how far Ukraine might go. Though 80 percent of Yuzhmash production is now non-military (*Financial Times*, 23 October 1996), participants in a recent visit to the plant have doubts as to the level of Ukraine's commitment to the MTCR and the authenticity of denials regarding alleged plant involvement in technology transfers to China and Iraq (Moltz, 1996). Though incontrovertible evidence of Ukraine's involvement in such activity has not been secured, it is clear that the country has diverted from its path of de-emphasizing arms exports as a means of attracting Western assistance and political capital that comes with supporting non-proliferation agendas.

2. The Role of External Assistance

According to the United Nations Development Program, multi-lateral, bilateral, and non-government assistance to Ukraine totaled US \$454.1 million in 1994, with industry receiving the largest amount at US \$137 million. The UNDP attributed the significant growth in contributions to this sector between 1993 and 1994 to assistance for defense industry conversion projects (UNDP, 16 November 1995). 1994 was a critical year for Ukraine in terms of receiving foreign aid and the reasons for its increase at that time are important indicators as to the motivations of donor countries. Before that time, Ukraine received little in the form of external assistance for industrial conversion, owing to its “isolation over the nuclear question and America’s russo-centric policies in 1992-1993” (Kuzio, 1994, p. 354). Kuchma’s election and the subsequent normalization of relations with the West sent a signal to policy-makers that Ukraine was committed to reform and western policy imperatives. The increase in aid for industrial conversion, and particularly the US Department of Defense industrial partnerships, can be seen as a reward for closing Chernobyl, ratifying the NPT, supporting the expansion of NATO in Central Europe, and not requiring revision of the CFE on the basis of flank limitations. These actions, as well as Kuchma’s economic reform programs, were recognized by the West and by international financial institutions who acknowledged the importance of Ukraine in Central-Eastern European stability and as a buffer between Russia and Europe (Kuzio, 1995).

Though the UNDP data may suggest that defense industry conversion in Ukraine is heavily subsidized by foreign aid, just four OECD countries listed Ukraine as a major recipient of aid in any form, across all sectors: Canada, France, Germany and the United States. The reports apply to 1995 and to trends established in previous years. Of the countries contributing to Ukraine, only the United States lists “key sector restructuring”—which would include defense industry conversion—as one of its “major sectors of assistance” (OECD, 1996, p.77). As indicated by Department of Defense industrial partnerships, the United States has made significant contributions in one-time grants and technical cooperation to industrial conversion projects, but this assistance was clearly conditional, and linked to the most sensitive military security sectors. Moreover, such assistance is waning. There is no United States funding included or planned for new direct defense conversion activities under Cooperative Threat Reduction (CTR) demilitarization programs in fiscal year 1996 or thereafter (Office of the

Coordinator of US Assistance to the NIS, Update, 1996). Further, Ustina Markus has suggested that while the Nunn-Lugar grants “may give impetus to some projects,” the funds which have been allocated are “insufficient to make a real difference” (Markus, 23 February 1996).

The investment guides published by the Department of Commerce and Bureau of Export Administration and the SABIT Defense Conversion Program certainly encourage non-military partnerships and production, but the effort is clearly tied to promotion and expansion of US business interests. While this is understandable, the role that assistance plays in the area of industrial restructuring provides a sharp contrast to the degree of interest and assistance that has been given in the issue areas that are not as strongly linked to economic or security concerns.

3. Questions for Further Research

3.1 Success of Independent Conversion Efforts

A number of Ukrainian defense firms, notably from the Department of Commerce guide, list civilian and converted production lines among their output without indicating investment by foreign partners. How successful is this production? Are markets being found for the goods produced by these enterprises, and is their quality high enough to sustain long-term civilian production and retention of employees?

3.2 Role of Private Investment in Defense Industry Restructuring

As indicated above, of the OECD countries, only the United States seems to have contributed significantly to defense industry conversion in Ukraine. But despite the fact that Ukraine has not been particularly attractive to foreign investors, to what degree does investment by private companies play a role? Information on private corporate investment in Ukraine can be difficult to obtain and the announcement that a partnership has been discussed or formed does not necessarily lead to details of subsequent projects. Though contacting individual firms which have reportedly formed joint ventures with Ukrainian firms has been beyond the scope of this

report, such research could give a broader representation of the factors influencing or encumbering defense industry conversion.

3.3 Consequences of Arms Export Expansion

What effect will the increases in Ukraine's arms exports have on its relations with the West, particularly the United States, for which adherence to non-proliferation agreements and assurances of stability seemed a prerequisite for aid? The United States has not allocated any new funding for defense conversion activities in Ukraine—is this linked to Ukraine's increased arms exports or the rumors that missile technology has been sold to China and Iraq? Finally, arms production has been suggested as a means of financing conversion—will the revenues from increased arms sales precipitate a return to large-scale conversion?

VI. AREA FOUR: DEMOBILIZATION AND REINTEGRATION OF MILITARY PERSONNEL

1. Demobilization: Obstacles and Opportunities

Ukraine inherited about 726,000 military personnel from the Soviet Union (*Financial Times*, 24 March 1995) and as of 1995, had the second-largest army in Europe (SIPRI, 1995). These numbers have been steadily reduced since 1992, though reports on specific numbers have varied. Recent estimates of troop strength range from 400,000-470,000 and demobilization goals from 350,000-400,000 (ITAR-TASS, 2 April 1996, *OMRI Daily Digest*; 13 February 1996, 14 March 1996, 27 September 1995). It is often unclear which particular personnel divisions are included in these estimates, which may significantly alter the numbers. In July 1996, the Ukrainian Ministry of Foreign Affairs reported that military personnel had been reduced by 127,277 in the previous two years, for a total armed forces of 367,789. These numbers did not include 40,000-60,000 National Guard and Border Troop personnel, or the Civil Defense Department. The report, prepared in response to US State Department questions, provided the following information on specific personnel divisions:

Ground Forces:	187, 789
Air Force:	70, 615
Anti-Aircraft Defense:	53, 420
Navy:	15, 285

(US Embassy Kiev, July 1996, p.3)

The 40,680 personnel discrepancy between the division figures and overall reported figure is unaccounted for by the Ukrainian Ministry of Foreign Affairs and it is unknown what the figure represents. The inconsistent information available on demobilization in Ukraine illustrates the complexity and scope of the problem. All of the demobilized and many of their families require services. There are few resources to assist them in their reintegration, and uncertainty abounds as to their exact numbers or whereabouts.

The Ukrainian military is rapidly downsizing its personnel and in a further attempt to reduce its armed forces, shortening the length of mandatory military service from 24 to 18 months (OMRI, No. 94). Like the country's military expenditures, the reductions have come about largely by default rather than policy—the government cannot afford to maintain them. However, it lacks adequate resources to provide pensions, housing, and social services to demobilized personnel. The Ukrainian Ministry of Foreign Affairs has acknowledged this in their report to the US State Department, adding that demobilization requires investment, and that the consistent reduction in military expenditures prohibit the allocations necessary for “benefits during retirement, housing, social adaptation” (US Embassy Kiev, 1996, p. 5). Though sales of surplus weapons were expected to provide the necessary resources, about 73,000 officers lacked housing as of July 1995 (Kuzio, 1995). A year later, a figure of about 70,000 was reported (Loose-Weintraub, 1996). The costs of demobilization and reintegration have often been calculated as exceeding those of retaining armed forces personnel. The Russian Defense Ministry has estimated the cost of demobilizing 100,000 servicemen at about US \$150 million—a figure of US \$600 million has been reported for total annual army expenditures (BBC, 25 June 1996). It has also been noted that the lack of housing and employment options may in fact curtail plans for further personnel reductions (*Financial Times*, 1995).

Conditions unique to Ukraine could pose great risk to the development of a democratic and civil society if appropriate reintegration services are not provided. The level of militarization in Ukrainian society was once very high, given the well-developed military industrial complex and prominence of the armed forces. Morale among troops is now quite low, the result of a dramatic drop in living conditions and the prestige of the military. A Ukrainian newspaper reported that “over the last few years, the status of a serviceman has been brought down from elite to beggarly” and the assessment of a recent poll involving over 1,000 Ukrainian officers indicates that dissatisfaction, propensity for criminal activity, and the unauthorized sale of military property and weapons is establishing the army as a “destabilizing force in society” (BBC, 25 June 1996). Living conditions among enlisted personnel have sparked strikes and rallies near Odessa and in Kiev and been blamed for the high rate of officer suicide (Kuzio, p. 305). With even less support, the social and economic conditions for demobilized troops are likely to be far lower, as they enter a transitional economy with high unemployment.

Ukraine's former military personnel have considerable potential for contribution to the country's socioeconomic progress. Many military officers are highly educated and technically trained. They have practical experience and leadership ability that, properly channeled, could make productive contributions to the country's economic growth. Without an appropriately designed and managed program of reintegration, their skills could easily be utilized in the very profitable sectors of organized crime or private 'security' forces. At least one program has been established to address the needs of Ukraine's demobilized, and though the numbers of demobilized may exceed its current capabilities, success has been demonstrated in the numbers of demobilized participating in the program as well as job placement rates.

2. Reintegration: Programs for the Demobilized

2.1 International Renaissance Foundation: Retraining of the Military Program (RMP)/ Centre de Formation aux Realites Internationales (CEFRI)

The International Renaissance Foundation (IRF) is a non-profit NGO established by the Soros Foundation to assist Ukraine in the development and management of its intellectual resources. In late 1993 it launched the Retraining of the Military Program (RMP), with the intention of assisting former Ukrainian servicemen to prepare for civilian professions by providing psychological counseling, training, and employment referral. The program, operating in seven regional centers throughout Ukraine, has been designed to serve up to 60,000 servicemen discharged and retired from regular armed forces, Ministry of Internal Affairs, Security Service of Ukraine, National Guard, and Border Security Forces after January 1, 1991. The program is financed primarily by the International Renaissance Foundation through the support of George Soros and the 1996 budget amounted to US \$2 million. Special programs such as the Centre de Formation aux Realites Internationales (CEFRI) training program, are financed by the IRF, the French government, and the European Community.

Retraining courses have included basic business principles to aid the officers in integrating into the market economy. Courses are held at local educational institutions which are chosen on a competitive basis and can be taken full or part-time. The RMP pays 70-90% of retraining costs, believing that the investment required by the officers increases the likelihood that they will enter the program with serious intentions of completing it. Job placement assistance is

provided after graduation. Specialized training is available for outstanding participants; the French organization CEFRI is working in cooperation with the RMP to provide intensive business education and training courses—conducted in Ukraine and France—for personnel who are interested in establishing their own small enterprises. The CEFRI program, which thus far has focused primarily on officers from the ranks of lieutenant to colonel, also provides services to spouses and families and emphasizes the development of skills that will have the most practical and immediate application for the participants (CEFRI, 1996). In conjunction with CEFRI, seven business centers are being established in RMP cities: Kiev, Lviv, Donetsk, Dnepropetrovsk, Odessa, Kharkhiv, and Symferopol. The RMP provides services to families as well. A portion of the RMP budget has been used to help ex-servicemen’s wives find employment in Head Start kindergarten programs.

TABLE 2: RMP IMPLEMENTATION AS OF MAY 1, 1996

	Kyiv	Crimea (Symferopol)	Dnepro- petrovsk	Donetsk	Kharkiv	Lviv	Odessa	Total
# of persons registered with RMP	15,051	3,162	2,580	2,101	3,107	2,885	2,972	31,856
Retrained 1994-1996	12,607	2,938	1,584	1,066	2,103	1,984	1,763	24,045
1996 only	2,020	553	175	155	375	429	228	3,935
Employed 1994-1996	2,647	2,140	1,265	928	1,057	648	1,246	9,931
1996 only	967	410	108	164	178	68	101	1,996
Average costs of retraining per person in 1996	\$93.30	\$114.60	\$102	\$75.30	\$72.30	\$51.50	\$85.30	\$84.90

Source: International Renaissance Foundation, Retraining of the Military Program, 7 June 1996.

As indicated in the table above, over 24,000 servicemen have been retrained as of May 1996 and participation has reached nearly 32,000. Of those trained, nearly 10,000 found employment ascribed to their participation in the program. Average costs of retraining servicemen vary by region due to differences in rental rates for training facilities and compensation for trainers, though RMP director Gennadiy Aksionov has indicated that costs tend to be leveling off. The CEFRI program had trained four groups of between 24 and 30 students in Ukraine as of July

1996. Two of those groups had also been trained in France and the third and fourth were expected in France in the fall of 1996 and winter of 1997 (CEFRI, 1996). A fifth CEFRI group is also planned.

According to preliminary surveys of demobilized and active servicemen, the majority are interested in starting their own enterprises, with 70% of such enterprises in the production sphere and 40% in food product production. From the perspective of the demobilized, the success of such enterprises is linked to the Ukraine MOD's willingness to release bases or other military property for use via privatization or lease. This applies also to other assets such as secondhand vehicles and other machinery. The RMP has identified a number of conditions necessary to the effective integration of demobilized personnel, including conversion of military property and resolution of the housing problem, but also points out that there is no government agency in Ukraine that is equipped to take on such tasks and that there is "no will on the part of the Ministry of Defense" to do so (RMP, 1996). Further, given Ukraine's high unemployment, new jobs must be created in order for ex-military personnel to fully reintegrate. To this end, the RMP has plans to provide direct support for startup of new businesses and development of existing enterprises. The program has also proposed a number of approaches to increase the job prospects for its trainees, including seasonal employment abroad, training in highly specialized fields, and training "in complex," whereby staff for an entire enterprise is trained at one time.

3. Housing Projects

3.1 United States—Khmelnitsky and Pervomaysk

In an effort to aid in their demobilization and transition to civilian life, housing has been constructed for former members of the 43rd Strategic Rocket Forces officers on behalf of the Defense Nuclear Agency. As of May 1996, 195 apartment units had been completed in Khmelnitsky—275 miles southwest of Kiev—under a US \$19.1 million contract of the US Army Corps of Engineers. A US \$17 million contract for a second phase of 410 units including utility systems was awarded that same month. Construction on phase two of the project was about 25 percent complete as of October 1996, with a projected completion date of 9 August 1997 (US Army Corps of Engineers, 1996). Projects are administered and funded under the Cooperative Threat Reduction Program (Department of the Army, 1996). The programs are part of an agreement between the United States and Ukraine in which the US has allocated US \$30 million in support of housing construction in exchange for Ukraine dismantling its strategic nuclear forces. All of the officers formerly involved in guarding and maintaining the Khmelnitsky site were promised housing upon their retirement. As part of the agreement for the first phase, Ukrainian defense industries assisted the United States firms in housing design and construction, Ukrainian firms were responsible for building the required infrastructure, and Ukrainians were employed as day laborers and cleanup crews (Stakhiv, 1995).

The United States also assisted in the construction of over 200 pre-fabricated housing units for retired strategic rocket forces in Pervomaysk. A Ukrainian factory that formerly produced shipboard equipment was converted to produce the housing components and 130 Ukrainian employees were hired; the US contractor provided equipment and training (Office of the Secretary of Defense, 1996). A US \$43 million dollar agreement was signed (*OMRI Daily Digest*, 5 June 1996.) and though the project was meeting with limited success due to unexpected costs (Almquist, 1996), the single-family and duplex units were completed in summer of 1996 (US Army Corps of Engineers, 1996).

3.2 Germany

The German government has supported the construction of four housing projects in Ukraine for ex-Soviet military personnel formerly stationed in Eastern Germany. The projects have included a training component and have expanded to include the construction of entire communities, including “schools, shops, clinics, administrative buildings, hairdressers, cultural and sports centres” (OECD, 1996). The projects also include all necessary utilities infrastructure and are designed for up to 200,000 former military or civilian residents. The projects have included opportunities for management training and transfer of construction technology and allocated 40 percent of funding for housing blocks, 30 percent for social infrastructure, and 30 percent for technical infrastructure (OECD, 1996). Over US \$4 billion were spent on the projects in Ukraine, Belarus, and Russia between 1991 and 1994 (OECD, 1996).

4. The Role of External Assistance

With the exception of the German program, external assistance in the area of demobilization and reintegration has taken two distinct paths: high-budget, governmental, conditional assistance that is finite in scope, and a modestly funded, primarily non-government program designed to ease the transition of former military personnel over the long term. The housing projects at Khmelnytsky and Pervomaysk are both expensive, high-profile programs at over US \$79 million combined. Though utilizing Ukrainian labor and industrial capacity, they are limited to the units pre-approved for construction. They are also limited in terms of the personnel they are designed to serve. The projects—funded under the United States’ Defense Nuclear Agency—have been and are being built specifically for former members of the Strategic Rocket Forces in direct exchange for Ukraine’s agreement to completely dismantle its nuclear forces. The number of personnel in the 43rd Strategic Rocket Army has been reported at 20,000 (Kuzio, 1995). The United States has not constructed or planned housing projects intended for non-nuclear decommissioned forces. These housing programs are providing essential accommodation to the Strategic Rocket Forces, but they stop short of the social services and employment training for which the German program has attempted to make at least some provisions. Though the Ukrainians intend to build a self-contained community at Khmelnytsky

which would include shopping areas, schools, and other services, there is no indication that United States plans to assist in these developments (Office of the Assistant Secretary of Defense, 1994).

The Retraining of the Military Program's current budget—at US \$2 million—is a fraction of that spent on housing for the former nuclear forces and is attempting to serve the retaining requirements of demobilized personnel in seven different regions, irrespective of military service affiliation. One facet of the program—the advanced business training provided by CEFRI—is funded through the French government and the EC, but it is administrated and funded primarily by the non-government Soros Foundation and the only prerequisite to receiving services is that participants pay a portion of their training costs. The program's focus is on acquisition of skills to support stable, long-term civilian employment.

The DNA housing projects and the RMP/CEFRI programs both meet critical, though separate needs, and in different geographical regions in Ukraine. Although both are assisting the civilian transition of Ukraine's military personnel, a program which integrates the housing and retraining needs of all Ukraine's military divisions would be more inclusive and perhaps of greater long-term benefit to the majority of demobilized. Such a program might require a higher degree of consultation or cooperation between governmental and non-governmental sources of assistance to balance budget requirements, special interests, and comprehensive approaches to personnel needs.

5. Questions for Further Research

5.1 Skills and Interests

The Retraining of the Military Program distributed a survey to 1,000 servicemen to determine their level of interest in business activities. Full participation was not achieved, and few of those surveyed had prior knowledge of business practices. Further data collection in this area, perhaps including skills assessment, would be of use in determining personnel interest in small enterprise and other employment options, guiding the design of training programs, and identifying training needs.

5.2 Social Service Needs

Though the social needs of demobilized servicemen in Ukraine may be clear, what is not known is the scope of those needs. Given the inconsistency of information on how many personnel have been demobilized, it is difficult to determine the exact dimensions of the problem. This is particularly true with regard to the families of demobilized personnel. The International Renaissance Foundation reports that most servicemen have families; with little information available on these families, the extent of their needs is unknown.

5.3 Risk of Criminal Activity

The risk of ex-servicemen turning to criminal activity has been identified by several sources, but it has not been assessed how many demobilized are actually engaged in such activity or what its impact may be on families. In an atmosphere of unemployment and economic hardship, the attractiveness and profitability of illegal activity is understandable, and more information might assist efforts in the design of programs for retraining and job creation. Furthermore, given the psychological stress of the transition to civilian life, those personnel involved in criminal activity may be burdened with additional counseling or training needs in order to integrate successfully.

VII. AREA FIVE: REALLOCATION OF MILITARY FACILITIES AND INSTALLATIONS

1. Military Installations in Ukraine

Military downsizing, demobilization, and the emergence of Ukraine as a non-nuclear state have left many military installations vacant or soon to be abandoned. Bases and equipment which sit unused constitute a drain on local economies, present environmental hazards, and their potential for future use declines through neglect and disrepair. The most heavily militarized regions of Ukraine were Crimea, Khmelnytsky, Lviv, and Chernigov. Crimea in particular is reported as requiring the most effort to reduce military infrastructure (FBIS-SOV-95-205, 23 October 1995). Accordingly, the areas which have received the most attention by both Ukrainian and foreign officials are the facilities of the disputed Black Sea Fleet and Crimea region and former nuclear missile installations in the Khmelnytsky oblast, three of which were the subject of a conversion feasibility study conducted by the United States Department of Defense. The Ukrainian government has made provisions for the transfer of general national property—by petition and subject to committee approval—to the jurisdiction of municipal governments. That property includes military sites, and based on US Department of Defense recommendations, regional, local, and community involvement is critical in each phase of successful conversion, from initial assessment to promotion and implementation.

Despite policies which release military property for civilian use, successful base reuse in Ukraine faces tremendous financial and practical challenges. Environmental cleanup alone will require substantial sums of money before many facilities are appropriately safe for civilian use. The community mobilization and interagency cooperation required for successful implementation will likely require some time as local and regional governments adjust to the responsibilities of needs and resources assessment, networking, promotional strategies, and long-term planning. Further, information on military installations in Ukraine is scarce and projections regarding their potential for conversion are therefore difficult to make, compounding the financial and logistical challenges to successful reuse.

1.1 The Crimea

There are 130 military facilities in the Crimea, the most heavily militarized region in Ukraine. Of these, 61 had been transferred to Ukraine as of early 1996 and 25 were pending final processing of documents (*OMRI Daily Digest*, 23 January 1996). Steps have been taken to transfer much of that property to the jurisdiction of local governments, an important step toward civilian use. The Ukrainian Ministry of Defense was developing protocol to transfer Crimean military property amounting to 16,000 hectares of land to local control as of October 1995. At that time, the Ministry had plans to retain and privatize the military sanatoriums in the area, hoping to use the subsequent profits to build housing for military personnel (*OMRI Daily Digest*, 26 October 1995). The military space stations in the area were slated for closure, as their capacity was intended to reach 200 satellites and Ukraine currently owns one (*Ibid.*).

1.2 Facilities of the Black Sea Fleet

The division of the military installations formerly supporting the Black Sea Fleet has been a source of great dispute between Ukraine and Russia for several years. Apart from disagreements over the allocation of military equipment and installations, the fleet's bases were both a drain on the Sevastopol economy and a source of significant environmental contamination for the area. At one point, the fleet's presence was costing the city of Sevastopol about US \$69 million each year in unpaid energy bills, lost tourism, and other expenses (*OMRI Daily Digest*, 18 October 1995). According to an analysis conducted by the Ukraine's Environmental Protection Ministry, the main base alone was dumping nearly 7,000 cubic meters of polluted water and 10 tons of petroleum products into Sevastopol Bay each day. Most of the Fleet's 46 auxiliary farms were also dumping their refuse directly into the sea. The majority of facilities for treatment and storage of petroleum products at the site are over 50 years old and major repair and renovation are required to return them to safe operating standards. Water treatment systems were lacking in about 25% of garage and vehicle depot car washes, and existing water and sewage treatment plants for most other Fleet facilities were operating at purification levels well below established standards. In some cases, contamination levels exceeding acceptable levels by 20-40 times have been reported (FBIS-TEN-96-001, 23 December 1995).

Division of Black Sea Fleet installations and equipment and disagreement over the jurisdiction of Sevastopol may impede the steps toward conversion which have already begun. The city was reopened to foreigners in 1995 and a plan has been launched to develop the Sevastopol area as a tourist destination and commercial seaport (OMRI, Daily Digest, 24 July 1996). However, the environmental inadequacies and dangers of many military sites in the area will need extensive evaluation and cleanup before they can be converted to non-military use, and current environmental hazards may impede commercial development of the area. Further, the Russian parliament declared Sevastopol an exclusively Russian military base in October 1996, questioning Ukrainian sovereignty and fueling the five-year dispute (*Financial Times*, 24 October 1996).

1.3 Silo Sites

Much attention has been given to the conversion of former nuclear missile silos, largely due to the high profile ceremonies at the Pervomaysk missile base involving Ukrainian, Russian, and US defense officials to symbolize the end of the Cold War and mark Ukraine's status as a non-nuclear state. The silo site destroyed in January 1996 by defense chiefs Shmarov, Grachev, and Perry was intended for future use as a wheatfield and all of the more than 80 silos at the site were expected to be destroyed by 1998 if US aid continues (*The Stars and Stripes*, 6 January 1996). Six months later, the three men returned to the site of silo No. 110—where 1,200 plants were growing—to plant sunflowers in honor of the last shipment of nuclear warheads bound for destruction in Russia (*Reuters*, 4 June 1996).

1.4 Airfields

Environmental cleanup of the land surrounding former military airfields near Uzyn, Bila Tserkva, and Lutsk has begun. The land had been contaminated by “gasoline lakes” and though rehabilitation of the land is expected to be quite expensive, steps have been taken towards recultivation (FBIS-SOV-96-015, 23 January 1996). The operation is being conducted by an environmental protection service, created in 1995 as part of the Radiation, Chemical and Bacteriological Defense Troops, and similar structures are being established in other military districts, armies, and brigades (FBIS-SOV-96-015, 23 January 1996).

***1.5 The 43rd Rocket Army—United States Department of Defense:
Ukraine Military Sites Conversion Report***

In June 1995, three different types of 43rd Rocket Army military installations in the Khmelnytsky Oblast were visited by a team of US DoD representatives to evaluate the feasibility of their use for civilian purposes. The team included two representatives from the Office of Economic Adjustment, which has been responsible for providing adjustment assistance to those areas in the United States impacted by defense program changes, including base closures. The bases evaluated included the Vehicle Support and Missile Maintenance Bases near Khmelnytsky and the Missile Launch Fortified Command Post near Golovanivsk, though the report claims that findings are applicable to the conversion of other military installations in Ukraine. The Department of Defense is convinced that though the size and design of military installations may vary, “the process for determining the best uses is transferable to any site” (Department of Defense, 1996). In assessing the three sites, the team evaluated the area economy, environmental contamination, and specific areas of conversion potential including various forms of transportation access. They also addressed issues of leadership and implementation, particularly the role of local government.

As mentioned before, the conversion potential of a military installation is enhanced if it is located in an urban area. Khmelnytsky is an industrial and regional government center, with former defense and civilian industries including electronics, plastics, and automobile parts production. The Khmelnytsky oblast was also the first in Ukraine to begin small-scale privatization. Thus, the evaluation team has characterized the prevailing attitude there as “pro-business” and also points to areas with business incentive and growth potential such as tourism, mining, food processing, and packaging (Department of Defense, 1996).

The environmental surveys conducted at the sites were preliminary and non-technical, based solely on visual observation. Though possible sources of contamination included various fuels and petroleum products, PCBs, and sewage effluent, the contamination level based on these observations was not assessed as significant (Department of Defense, 1996). Nonetheless, the team suggested that environmental sampling and radiological tests would likely increase the acceptability of the sites for civilian and commercial use.

1.6 Suggested Uses for 43rd Rocket Army Sites in Khmelnytsky

Vehicle Support Base—Good vehicular access to this site on the main highway between Khmelnytsky and Vinnytsa. Barracks, dining hall, and other structures have a number of potential uses, including:

- Education, specifically technical trade skill training for officers and civilians
- Expanded technical training in business development including marketing, retail skills, computers use in business
- Corporate training facility for specific business needs like equipment service and repair, truck driver training
- Specialized health care such as mental health, drug and alcohol rehabilitation, convalescent care, elderly care
- Transportation vehicle repair and maintenance for light trucks and cars, municipal buses, heavy trucks, or support for containerized cargo units which may be an emerging goods shipment method in Ukraine
- Industrial or business ‘incubators,’ places where one or two persons can create a new business that will eventually increase in size
- A small business center for auto repair, equipment service and repair, or wholesale supplies
- A business skills training center to help entrepreneurs plan for their businesses and learn how to manage and promote them
- An agricultural training center for farming techniques, farm equipment or vehicle repair and maintenance, and farm management

Missile Maintenance Base—Good railroad access, though road access would require improvement for trucks and other vehicles. Potential uses are best suited to enterprises which require materials shipment and delivery by rail and include:

- Chemicals production and storage
- Large vehicle maintenance and repair
- Fertilizer production and storage
- Plastic products

- Businesses requiring a more remote location away from population centers, such as production of explosives components
- Small firms that provide products or services to larger ones located at the site, such as machine shops, calibrations services, refrigeration services and equipment repair
- Specialized training for businesses located on the site

Fortified Command Post—The facility is located approximately 65 kilometers from Khmel'nitsky and access roads are in poor condition, thereby limiting the potential uses of the site. It was recommended that a single large business that could use all of the buildings might be the most suitable. The large refrigeration capacity at the site could be used in an agriculture-related business such as food processing or meat packing, utilizing the resources of the surrounding farms. (Department of Defense, 1996, pp. 6-7.)

The evaluation team emphasized the role of local government as a focal point for all conversion activity, particularly as Ukrainian law now allows for the transfer of military property to the oblast where it is located. Specifically recommended is a planning committee which includes elected officials in Khmel'nitsky and representation of public and private sector organizations and individuals. Further, the team suggested cooperation between the military and the local public and private sectors to best balance public needs with the military's technical knowledge of the site's resources.

As of December 1995, the Ukrainian Ministry of Defense had intended to draft a plan for the use of 43rd Rocket Army infrastructure within a maximum of two years. Defense Minister Shmarov declared at that time that the silo-based launchers, aircraft repair works, and other infrastructure and training grounds were national resources which should be used to the benefit of the national economy, emphasizing that reuse was of greater importance than government or private ownership (FBIS-SOV-95-237, 8 December 1995). A 3600 hectare training ground near Kirovograd—a possible site for gold and uranium extraction—had already been turned over to local authorities by the Ministry of Defense (FBIS-SOV-95-237, 8 December 1995).

2. The Role of External Assistance

Beyond the feasibility assessment conducted by the US Department of Defense at Khmel'nitsky, there is little evidence of external assistance in this area. As is the case in industrial restructuring, priority attention has been given to military installations formerly associated with weapons of mass destruction. Though there have been reports that the 43rd Army installations are awaiting United States funding (Klein, 1996) information is unavailable on specific base reuse projects at the sites which were evaluated. The intensive environmental assessments, cleanup, and other costly preliminaries to actual reclamation of Ukrainian military installations may be a powerful deterrent to donor countries or potential investors who have little guarantee of the returns.

3. Questions for Further Research

3.1 Data Reliability

Little concrete data is available on Ukrainian military installations, including type, location, condition, and infrastructure. Such data is increasingly difficult to obtain as Ukrainian officials become more and more accustomed to receiving payment for giving information (Klein, 1996). It is difficult to evaluate the overall status of base reuse in Ukraine or the potential success of such reuse without more comprehensive and reliable data on the installations themselves.

3.2 The Resources of Local Communities

Active participation by local government is critical for success in base conversion. What local organizations and planning committees exist in those communities who face the challenges of base closure that could take up the needs assessment and feasibility studies required for development and implementation of a base reuse project?

VIII. AREA SIX: ALTERNATIVE USE, DISPOSAL, AND SCRAPPING OF SURPLUS WEAPONS

1. The Problem of Surplus Weapons in Ukraine

The breakup of the Soviet Union left Ukraine with a highly developed military industrial complex, the third largest nuclear weapons arsenal in the world, and substantial stockpiles of conventional weapons, around 800,000 tons by some estimates (*Financial Times*, 20 January 1995). Despite its current status as a non-nuclear state and implementation of CFE Treaty requirements, surplus weapons are and will continue to be available in large quantities in Ukraine, providing a source of revenue as well as posing environmental and internal security hazards. Ukraine claims to have stockpiled vast quantities of munitions, and still more excess weaponry can be expected when the Black Sea Fleet division is finally resolved and as the armed forces are restructured. The production of new weapons further increases surplus stocks, as technological advancement renders equipment obsolete. These excess weapons pose significant environmental and safety risks and threaten both domestic and regional security.

TABLE 3: ESTIMATED FUTURE SURPLUS CONVENTIONAL WEAPONS

Tanks	approx. 1,800
ACVs	approx. 2,000
Artillery	approx. 1,000
Combat Aircraft	approx. 500
Ammunition	approx. 800,000 metric tons

Source: BICC, 1996, p. 220. Based on announced force reductions.

The environmental damage caused by the rusting ships and submarines of the Black Sea Fleet and their lack of purifying devices for sewage has damaged the Ukrainian fishing industry, reduced biological species by 15-20 percent, and at US \$19.4 billion, almost twice exceeded the value of the equipment (FBIS-TEN-96-001, 23 December 1995). “Dozens of metric tons of lethal objects” in a Nikolayev oblast munitions repository are easily accessible to the public due to poor monitoring and lax security controls—local teenagers have used high-explosive fragmentation incendiary shells to light bonfires in the adjacent forest and other munitions have

been used to stun fish at a nearby reservoir. Near the same munitions repository a “stray” air-to-surface missile has been found (FBIS-SOV-95-155, 9 August 1995).

Illegal sale of surplus weapons by members of the armed forces and acquisition by organized crime groups can pose a significant threat to internal and regional stability. The weapons and military equipment which are disappearing from Ukrainian depots is “constantly increasing” and being sold by unit commanders to buyers abroad or to members of organized crime. In 1993, Ukrainian border troops impounded 2,000 firearms and 400,000 bullets, and though the claim was quickly refuted, talks were reportedly held with the IRA in Kiev regarding weapons sales. Near Odessa, 60 “surface-to-air” missiles disappeared from a helicopter base and the same number of anti-aircraft missiles were found in a forest near Mykolayiv, with no indication of their source. Furthermore, despite repeated government denials of illegal exports to Yugoslavia, Albania, and South Africa, the Ukrainian Deputy Foreign Minister admitted in 1995 that some brokers were able to sell to countries where weapons exports had been prohibited (FBIS-SOV-95-137, 7 July 1995).

2. Conventional Weapons Dismantlement, Destruction and Conversion

2.1 Treaty on Conventional Armed Forces in Europe (CFE)

The 1990 CFE Treaty placed limits on five categories of major conventional weapons: tanks, armored combat vehicles, artillery, combat aircraft, and attack helicopters. Approved methods of reduction under the treaty included destruction to the extent that the weapon is no longer useable as such, conversion to non-military use, and military reclassification.

TABLE 4: UKRAINIAN WEAPONS REDUCTION UNDER CFE

	Tanks	ACVs	Artillery	Aircraft	Helicopters	Total
Holdings at entry into force (17 July 1992)	6,128	6,703	3,591	1,648	271	18,341
Holdings at end of reduction period (17 November 1995)	4,026	4,919	3,727	1,008	270	13,950
CFE-imposed ceilings	4,080	5,050	4,040	1,090	330	14,590

Source: *Arms Control Today*, 1995, pp.29-30.

In response to complaints from Belarus regarding the lack of international assistance for often expensive destruction procedures, the United States pledged US \$5 million each to that country and Ukraine for destruction of treaty-limited equipment (SIPRI, 1995). The majority of ACVs—including BMP-1 and BMP-2 vehicles, BTR armored personnel carriers, and PT-76 tanks—were destroyed at an armored vehicle repair plant near Zhytomyr, though some—specifically tanks and BMPs—have been converted to such non-military vehicles as tractors and firetrucks (FBIS-UMA-95-206-S, 16 September 1995). As of July 1995, 3,600 armored tanks—primarily T-55, T-64, and T-72s—were scheduled for scrapping and conversion to alloyed steel (FBIS-TAC-95-003, 29 June 1995), though the holdings figures at the end of the reduction period would indicate that less than number were actually destroyed. TU-16 and TU-22M bombers were among the aircraft destroyed under the treaty (FBIS-SOV-95-141, 21 July 1995).

Though the above table indicates that Ukraine met its reduction liabilities and in some categories reduced more than the required number of weapons, the still-unresolved division of the Black Sea Fleet raises questions of full compliance, as some surplus equipment exists in the Fleet's naval infantry units and this equipment falls under the additional naval infantry-associated reduction obligation (BASIC, 1996; Office of the Coordinator of US Assistance to the NIS, 1996). Nonetheless, Ukraine has met all CFE data and notification requirements and, though unable to fully comply with flank limitations due to economic difficulties, has demonstrated determination and commitment to full implementation (Office of the Coordinator of US Assistance to the NIS, 1996).

Box 5: Surplus Weapons Dismantlement: NATO Advanced Research Workshop, Kiev

An international seminar on the dismantling and conversion of surplus weapons was held in Kiev in September 1995. The seminar, organized by the NATO Scientific Committee, the National Academy of Sciences in Ukraine and the Ukrainian branch of the World Laboratory focused on safe dismantlement, storage, and disposal as well as the opportunities for profit in munitions dismantlement. The seminar participants included about 50 scientists from Ukraine, Russia, Belarus, the Czech Republic, Germany, Belgium, France, and the United States (*Defense News*, 18 September 1995; FBIS-SOV-181, 19 September 1995). According to reports from that conference, the Ukrainian munitions requiring demilitarization amounted to 320,000-390,000 tons, including about 40,000 tons of propellants and high explosives as well as about 5,000 tons of “Heptyl” (UDMH) liquid rocket propellants. Ukraine does not have the facilities to destroy these munitions without environmental hazard and to avoid transporting potentially unsafe munitions the government intends to install mobile incineration plants based on foreign technologies and will attempt to destroy about 10,000-15,000 tons per year using this method. Their plan also called for creating technologies which could convert the fuels and propellants into derivatives for commercial application. The Western conference participants expressed concern over this idea, citing the high expenses and amount of time required for such procedures, particularly given the minimal returns of converted material, but Ukrainian scientists argued that their low labor costs and lack of hard currency to import such materials do not justify wasting the resources

Source: Schubert, 1995.

2.2 Scrapping and Dismantlement: Generating Revenue and Employment

The sale of decommissioned or partially completed ships and aircraft carriers has become a common way for Ukraine to rid itself of surplus while generating revenue from the scrap value of such equipment. In 1992, the now defunct Commercial Center at the Ministry of Defense sold 13 vessels as scrap iron and the following year, Ukraine sold ships as scrap-iron to Britain, Russia, and Turkey for a total of US \$579,000 (FBIS-SOV-94-051, 16 March 1994). Steel sales to China alone were estimated at 800,000 tons in 1994, though traders in Beijing and Hong Kong have expressed concern over the steel’s potential radioactivity and alleged forged importation certificates. The Ukrainian Embassy claimed that the Ukrainian government was not responsible for ship steel transactions (FBIS-SOV-94-168, 30 August 1994). Construction on the aircraft carrier *Varyag* was halted following the collapse of the Soviet Union due to Ukraine’s inability to fund its completion, which at that time stood at 70 percent. The vessel was planned for transfer to an unnamed Irish company in the summer of 1996 in a deal which was expected to yield about US \$10 million in scrap value (BBC Monitoring Service, 25 June

1996). Another unfinished aircraft carrier—the Vladivostock—has also been scrapped and its metal sent to the Azov steel mill for processing (FBIS-SOV-95-137, 7 July 1995).

Weapons scrapping is providing needed employment as well as revenue. Over 1,000 Ukrainian jobs were created by the formation of Alliant-Kiev, a joint-stock company opened in January 1995 by the US company Alliant Techsystems, Britain's Rapierbase Ltd. and the Ukrainian Defense Ministry to dismantle conventional weapons. Under the initial contract, the partnership plans to reclaim four or five tons—roughly equal to 1,500 rounds—of high explosive, large caliber projectiles per day for a total of 220,000 tons over a five-year period. The operation will be administered in Ichnia and five other locations around Ukraine and is designed to reclaim steel, brass, copper, aluminum, and explosives to be sold on the world market. According to Alliant, the demilitarization process is environmentally safe, using a high-speed fluid jet to remove explosives from the projectiles. The casings are then taken apart and the explosives pressed into cakes for sale or further processing (*Post-Soviet Nuclear and Defense Monitor*, 1995; *Financial Times*, 20 January 1995). Much of the recycled explosive material will be used in Ukrainian coal mines (*International Herald Tribune*, 1994).

Alliant-Kiev, according to Alliant Techsystems, is the first full-scale munitions demilitarization and conversion facility in the world (Alliant Techsystems, 1995). Though their initial contract spans only five years, the company is hopeful that armed forces reductions, aging ammunition stocks, and weapons obsolescence will generate surplus beyond the estimated 800,000 tons currently in existence, which would allow business to proceed for at least a decade (*Post-Soviet Nuclear and Defense Monitor*, 1995; *Financial Times*, 20 January 1995). Despite these plans, Alliant-Kiev has experienced complications in dismantling the weapons and delivering the converted materials. Dismantling efforts have been hindered by bureaucracy, delays in export licensing, and difficulties with Ukrainian customs are delaying shipments of the demilitarized weaponry and Ukrainian reluctance to give Alliant officials the blueprints of 1930s artillery shells (*International Herald Tribune*, 1994).

Other joint ventures have been established to address surplus conventional weapons destruction. As a result of a partnership formed through the US Department of Commerce SABIT Defense Conversion Program, General Atomics and Alliant Techsystems plan to assist the Pavlograd Chemical Company in destroying conventional and artillery ammunition as well as solid fuel SS-24 missiles (Office of the Coordinator of US Assistance to the NIS, 1996).

Independent efforts are also being made. In 1995 alone, Ukrainian engineers defused almost 41,000 mines, air bombs, and shells which had been stored in warehouses since World War II (BBC Monitoring Service, 27 June 1996) and the Ukrainian firm Spivdruzhnist is expected to demilitarize and reprocess about 100,000 tons of surplus ammunition (FBIS-SOV-95-041, 2 March 1995).

The inability to repair or maintain equipment is also contributing to weapons dismantlement. In 1995, due to lack of fuel and spare parts, only 15% of Ukraine's Tu-160 "Black Jack" and Tu-95MS "Black Bear" strategic bombers were considered capable of flying without repairs. The aircraft which did not pass technical inspection after evacuation to Russia were to be dismantled and used for spare parts (JPRS-TAC-95-002, 14 June 1995).

2.3 Surplus Weapons Export and Trade

The desire to generate revenue and expand its share of the weapons market, in addition to disrepair and a lack of resources for maintenance have compelled Ukraine to sell a variety of surplus weapons. The country is seeking to build a reputation as an exporter of "NATO-class" weapons through both state and private weapons manufacturing, and to more easily break into world markets, is selling both new and used equipment at prices which are at least 20 percent lower than any other source. (FBIS-UMA-96-085-S, 10 April 1996.)

In 1993, the Universal Ukrainian-Siberian Commodity Exchange offered more than US \$2 billion of surplus military hardware for sale, including 27 MiG 27s, 14 YaK-28PP Bombers, 50 T-62 tanks, 30 T-64P tanks, an anti-aircraft system, combat helicopter, and a variety of guns, missiles, howitzers and trucks (FBIS-SOV-93-024, 8 February 1993; *Financial Times*, 6 February 1993, p. 1,22; FBIS-SOV-93-022, 4 February 1993). Depending on their date of manufacture, some of those arms may have fallen under the limitations specified in the CFE Treaty, which did not allow sales as a means of eliminating them. It was also unclear if all of the weapons offered for sale actually existed, or if the list was released as a means of identifying parties interested in arms purchases. Those weapons which would have fallen under CFE limitations were used T-55, T-62, T-64, T-72, and T-80 tanks, MiG-27, Su-17, and YaK-28 aircraft, and Mi-8T helicopters. These weapons in the amounts offered could only have

been obtained from regular army units and their sale would have constituted a treaty violation (FBIS-SOV-93-031, 18 February 1993, p. 1-3).

Also in 1993, Iran purchased 50 MiG-29 fighters, 200 tanks, and eight SS-N-22 supersonic surface anti-ship missiles from Ukraine (FBIS-SOV-95-137, 7 July 1995). That same year, tanks were sold to Slovakia and Russia for US \$575,000, aircraft including satellites and missile-carriers for US \$5,199,000, and radio guidance equipment for US \$3,651,000. Russia and Greece purchased military and rescue vessels for a total of US \$721,000. The greatest portion of military exports in 1993 consisted of bombs, grenades, torpedoes, missiles, and cartridges, sold at a total of US \$9,772,000 (FBIS-SOV-94-051, 16 March 1994).

More recent buyers of Ukrainian surplus include Sri Lanka, which purchased Mi-17 military transport helicopters and three An-32 military transport planes in late 1995 and early 1996 (FBIS-SOV-96-011, 17 January 1996) and Russia, which received 25 strategic bombers (10 Tu-160 and 15 Tu-95 MS) and about 300 air-to-ground guided missiles in 1996 (*OMRI Daily Digest*, 1 April 1996). Two firms specifically established to sell weapons—Progress and Ukrimash—are dealing in surplus equipment including missiles, launchers, and aircraft, of which Latin American countries are reportedly buying up used AN models (FBIS-UMA-96-085-S, 10 April 1996).

The United Nations Register of Conventional Arms does not require countries to distinguish between new or second-hand weapons. Determining the level of surplus equipment from Register data is therefore difficult without a thorough knowledge of a country's current weapons manufacturing capabilities. According to the most recent register data, Ukraine's conventional weapons exports are increasing and it is probable that those reported for 1995 include surplus, most likely T-72 and T-55 tanks sold to Poland and Uganda.

Surplus sales have also been generated by economic difficulties and the trading of equipment which Ukraine cannot afford to maintain or repair. Two space monitoring ships—Cosmonaut Yuri Gagarin, the largest ship in the world equipped for scientific activity, and the Academician Sergei Koroleva—were reported for sale in late 1995. Though the information was not officially released, press speculation identified China as a buyer for the ships, which were used for monitoring and controlling Soviet space flights (*OMRI Daily Digest*, No. 180, 15 September 1995). The division of the Black Sea Fleet is still under dispute, but 1995 estimates suggested that over 70 percent of its vessels were in disrepair (*OMRI Daily Digest*, No. 207, 24 October

1995). Nearly a year later, Vice Admiral Volodymyr Bezkorovainy announced that the 54 vessels which were planned for transfer to the Ukrainian Navy are “inoperative” and “nothing more than scrap metal” (*OMRI Daily Digest*, No. 151, Part II, 6 August 1996). The poor condition of the Fleet will likely contribute to an excess of equipment that Ukraine cannot maintain, as well as exacerbate environmental hazards. Weapons sales, scrapping, and environmental damage are possible outcomes in the Black Sea Fleet situation which may bring Ukraine further challenges in surplus weapons management.

Unreported trade in surplus weapons or scrapped military hardware has been implied in several of the cases above, and indeed such activity is difficult to either report on or quantify, as information on sales presumably sanctioned by the Ukrainian government is quite unreliable. According to one source, such data was nonexistent in 1993 (FBIS-SOV-94-051, 16 March 1994). In an opinion poll of 1,003 Ukrainian officers, 70 percent identified “the uncontrolled sale of military equipment” as one of the most serious issues facing the army (*OMRI Daily Digest*, 25 June 1996). Unauthorized trade is most likely widespread and will continue, facilitated by porous borders, Ukraine’s position as a transshipping point, disenfranchised servicemen, and abundant weapons stocks (FBIS-SOV-95-137, 7 July 1995).

2.4 Ukrainian Surplus: A Long-term Issue

Despite the success of CFE implementation and the number of destruction efforts underway, surplus weapons are likely to present long-term conversion challenges in Ukraine. In addition to reductions in military expenditures, weapons obsolescence, and other means by which surplus is generated in many countries, the ultimate fate of Black Sea Fleet equipment and reductions in military personnel will doubtless contribute to the size of Ukraine’s surplus weapons stocks as well as the problems associated with them. Surplus stocks are already substantial. As of July 1994, an estimated US \$76 million in unsold military hardware was stored in Ukrainian warehouses (Markus, 23 February 1996). Whether scrapped or sold, the management of these weapons will play a significant role in Ukraine’s future for years to come.

*“Our arms stockpiles are now colossal. . . Huge ammunition dumps remain.
This is thousands of rail cars, hundreds of thousands of tons. This is a reserve*

valued at tens of millions of dollars. And it will now feed the country for the next 10-20 years.“

Vladimir Mukhin, head of Ukrainian parliamentary Commission for Defense and State Security

3. The Role of External Assistance

In contrast to the tremendous efforts made to remove nuclear weapons from Ukrainian soil and eliminate missile launch-control silos, Ukraine has received comparatively little help in addressing the challenges of managing its surplus conventional weapons. Though the NATO Workshop on demilitarization of conventional munitions is an example of multilateral steps taken to discuss the problem, little in the form of cooperation between participating countries and Ukraine seems to have materialized. The conference points up Ukraine's need for assistance in addressing this issue, as the forms of munitions destruction which the country can most easily afford are also those which draw Western criticism for being environmentally unsound. The assistance which has been extended falls primarily into two categories: that which was given to facilitate compliance with CFE treaty obligations and that in support of potentially lucrative joint ventures.

As noted above, the United States granted US \$5 million to Ukraine to offset the costs of destroying treaty-limited equipment under the congressional Project Peace. In contrast, as of 31 March 1996, over US \$267 million had been budgeted for nuclear weapons dismantlement under the Cooperative Threat Reduction Program (Office of the Coordinator of US Assistance to the NIS. Update, 1996). The reasons for this are clear. Unlike its former weapons of mass destruction, Ukraine's conventional weapons arsenal does not pose enough of a threat to the security interests of the United States or other Western countries to excite much attention or warrant assistance. It has been suggested before that US interest in providing assistance to Ukraine has cooled in the wake of Ukraine's non-nuclear status, and Sherman Garnett of The Carnegie Endowment for International Peace has noted that the interests of "most Western statesmen. . .were much clearer when Ukraine was seen as on the verge of collapse, shilly-shallying over Chernobyl or hesitant on nuclear disarmament" (Garnett, 1996).

The Alliant-Kiev venture, though administered by a private corporation, has received considerable financial backing from the US Government. Alliant Techsystems received a US

\$15.5 million loan for its investment in the project, in addition to US \$20 million in political risk insurance by the US Overseas Private Investment Corporation (OPIC) (Harkin, 1996). OPIC is a self-sustaining government corporation which directly supports and promotes US private investment in foreign economies by providing political risk insurance such as currency inconvertibility and political violence coverage and establishing equity funds for investment. According to OPIC CEO Ruth Harkin, the Alliant-Kiev project should generate US \$45 million in US exports (Harkin, 1996).

4. Questions for Further Research

4.1 Sources of Future Ukrainian Surplus

The armed forces drawdown and Black Sea Fleet have both been identified as sources of future surplus weapons in Ukraine. Enterprises such as Alliant-Kiev are literally banking on it. Of what weapons categories will this surplus primarily consist? Will it be dismantled or sold, and to whom? What are the security and environmental implications for stockpiles of surplus that may exist for “the next 10-20 years”?

4.2 Illegal or Unauthorized Sales

In a number of the arms transfer cases described above, as well as sales of scrap material, illegal deals or denial of involvement by Ukrainian officials has played a role. Given the vast amount of surplus that has been and is expected to be generated in Ukraine, and the relative ease with which it may be sold, the question of what weapons are being transferred and to whom is one which merits as careful monitoring as possible, within the limits imposed by the unofficial nature of the activity.

4.3 Success of Joint-Venture Dismantling Projects

The Alliant-Kiev project has been in operation since early 1995 and at that time was experiencing bureaucratic and other difficulties. Despite its position as the first full-scale munitions demilitarization and conversion facility in the world, the enterprise has not



responded to repeated inquiries regarding its current status, and its success in meeting weapons reclamation goals is difficult to determine.

IX. INTEGRATING THE SIX AREAS: SYNERGIES AND STRATEGIES

With only a few exceptions, conversion assistance to Ukraine has arisen primarily out of (largely US) security and business interests. Industrial conversion, reorientation of R&D, and the destruction and dismantlement of surplus weapons have attracted the most attention and investment from outside sources, though in each of these areas former nuclear facilities and scientific expertise have dominated their concern. Much less assistance has been given in those conversion areas which—though perhaps of little consequence to those outside of Ukraine—are critical to its internal security and economic development, such as the demobilization and reintegration of military personnel and conversion of the conventional weapons industry. Now that Ukraine is firmly established as a non-nuclear state, the incentives for external assistance may be weaker, but Western policy-makers should continue to support conversion efforts. Particularly as Poland and Hungary, new candidates for NATO membership, border Ukraine, the country's role in maintaining long-term Central and Eastern European stability must be recognized and supported.

Moreover, in many cases, developments in one issue area have facilitated or strongly impacted events and progress in another. Thus, the six issue areas are often interrelated in both socioeconomic and security terms. Some direct links between issue areas in Ukraine are summarized below. This list is almost certainly not exhaustive.

- Reductions in the military budget has necessitated a reduction in armed forces.
- Reductions in the armed forces can generate surplus weapons.
- Reductions in the military budget have resulted in insufficient funds for the reintegration of demobilized troops, including retraining, housing, and other services.
- Lack of funds in support of demobilized personnel may hinder intended troop reductions.
- Military personnel who lack sufficient economic support are likely to engage in unauthorized sales of surplus military equipment.
- The sale of surplus weapons has been proposed as a means of financing retraining and reintegration of troops.
- The reduced military budget has often been insufficient for repair or maintenance, generating surplus weapons or parts.
- R&D projects have been established which address soil decontamination. This could be applied to military base cleanup.
- Base closures can generate surplus weapons.
- Development of the arms industry has often been proposed as a means of financing conversion projects.

- Industrial conversion has been applied to the construction of housing units for demobilized Strategic Rocket Forces.

The relationship between these issue areas could result in a number of different conversion outcomes. The land and buildings of former military property have tremendous potential for civilian use which could be linked to the creation of employment for demobilized troops and housing and social services in support of their reintegration. Many demobilized servicemen who are currently involved in the IRF retraining program detailed in section four have in fact expressed a belief that their future enterprises would not be successful without the reallocation of former military property and equipment. Specifically, they have suggested reallocation of such property for civilian training purposes and business development. Expansion of businesses into converted military installations could indeed create needed employment for former military personnel, as well as provide models for future base reuse, but the condition of the bases will have a great impact of the feasibility of their reuse. Although closed bases were transferred to local or regional jurisdiction as of April 1995, the equipment and infrastructure remain the property of the Ministry of Defense, hindering privatization efforts (Klein, 1996).

Additionally, a number of problems—such as lack of funds or environmental contamination—are common to more than one issue area and are either impeding conversion efforts or arising out of the inability to implement them. Safe civilian use of many military installations will require extensive cleanup efforts, but based on the interests of external actors, this task will likely be left to Ukraine. Environmental damage also occurs as surplus weapons degrade, increasing the costs and hazards associated with their disposal. Financial constraints in many cases prohibit Ukraine from independently employing environmentally safe disposal or destruction methods, as discussed at the September 1995 NATO workshop in Kiev.

Finally, the synergies between issue areas could help define the terms in which external actors interact with Ukraine and how the interests of both might be best represented. Projects aimed at reorienting military research and development, for example, can contribute to technological and industrial development in Ukraine, creating domestic employment and foreign investment opportunities while also minimizing brain drain to potentially threatening or unstable nations. Moreover, successful R&D projects might provide more environmentally sound means of surplus weapons disposal or the technical know-how required by former defense industries to

undertake civilian production with less reliance on the availability of foreign assistance and investment.

Ukraine's position between Russia and the West is critical for regional stability and its socioeconomic vitality should be of concern to any country for whom that relationship is politically or strategically important. Successful conversion across all six issue areas is essential to an economically stronger and less dependent Ukraine. New policy goals that address Ukraine's conversion challenges and the interplay between them should form the basis for further research and Western political agendas.

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