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THE DESTRUCTION OF THE ENVIRONMENT IN THE FORMER SOVIET UNION

LISA OSOBA[†]

Because of the weakness of environmental protection legislation in the former Soviet Union the former republics of the Soviet Union occupy one of the most ecologically devastated areas on the planet. The Chernobyl disaster came to be seen as a symbol of all that was wrong with the Soviet system by observers both within and outside the USSR. Concerns about safety at existing nuclear facilities, the disposal of nuclear waste, and the potential migration of nuclear materials and knowledge out of the former Soviet Union are widespread both within the republics and internationally. Greater regulatory action on the national level is required to ensure the support of the international community, and to provide some certainty that minimum levels of safety are being achieved. The international community needs to contribute a creative approach to regulation of the nuclear industry, allowing for some local input and strengthening international institutions. The sovereignty of nations must be balanced against the need for international environmental security in order to achieve progress in the regulation of the nuclear industry.

À cause de la faiblesse des lois sur la protection de l'environnement dans l'ancien Union soviétique, les anciens républiques de l'Union soviétique occupent une région du monde qui se trouve parmi les régions de la planète les plus ravagées par la pollution. Le désastre à Chernobyl est devenu un symbole, selon des observateurs à l'intérieur ainsi qu'à l'extérieur de l'URSS, de tout ce qui ne marchait pas avec le système soviétique. Des soucis au sujet de la sécurité des réacteurs nucléaires actuels, de l'enlèvement des déchets nucléaires, et de la possibilité de la migration des matériaux nucléaires sont omniprésents. Les républiques ont besoin de plus de réglementation au niveau national pour assurer le soutien de la communauté internationale, et pour assurer un niveau minimum de sécurité. La communauté internationale a besoin d'une façon créative d'aborder le problème de la réglementation de l'industrie nucléaire, une solution qui tient compte de l'opinion locale et qui renforce les institutions internationales. Pour avoir du succès à régler

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l'industrie nucléaire, il faut peser la souveraineté des nations et la nécessité de la sécurité environnementale internationale.

I. INTRODUCTION

[T]he fragility of the sarcophagus built around the crippled reactor in a desperate attempt to contain its radioactive poisons resembles the vulnerable, unstable, and fragile condition of the members of the Commonwealth of Independent States....

Ellen Bober Moynagh, "The Legacy of Chernobyl: Its Significance for the Ukraine and the World"¹

The daunting problems surrounding the nuclear industry in the states of the former Union of Soviet Socialist Republics are a powerful example of the legacy of the political and economic forces which were at work in that part of the world during the greater part of the present century. Today, in the young nations of the Commonwealth of Independent States (CIS), new governments struggle to extricate themselves from the past and at the same time to cope with astounding challenges arising from the political transformations of their countries. Tremendous economic and ethnic pressures have forced environmental issues to remain at a low priority level; in this sense, little has changed since the years of Soviet rule, except that the pressures are now greater than ever. Yet vast areas of the former Soviet Union can be considered "ecological disaster zones," from the fouled shores of the Baltic Sea and the pollution-choked Ob and Volga river basins, to the acid-rain-ravaged forests of the far east. In the context of this critical state of affairs, what can traditional notions and mechanisms of international environmental law offer to the states of the former Soviet Union in an attempt to help them overcome the environmental problems which plague them?

This paper will examine the genesis of the massive environmental problems in the former Soviet Union, as well as the relationship between those problems and the breakup of the Soviet Union. Next, it will assess the particular difficulties and dangers

¹ (1994) 21 B.C. Env'tl. Aff. L. Rev. 709.

associated with the nuclear industry, and the current strengths and weaknesses of the international regimes and funding schemes which deal with the industry. The paper will also address the question of what will need to be done in the future to deal more effectively with the issue of nuclear regulation in the former Soviet Union. Finally, it will conclude by examining the ultimate question which arises from the paper: to what extent can the pursuit of sustainable development and protection for all of the world's nations be balanced against the right to some sense of state sovereignty for the nations with the most severe problems?

II. ENVIRONMENTAL LAW IN THE SOVIET UNION

1. Ecology in Soviet Thought

The region including Eastern Europe and the former Soviet Union is one of the most thoroughly ecologically devastated areas on the planet, and Soviet political domination of the region during most of this century provides a key to the reason for that environmental destruction. The Soviet version of Communist ideology centred on the creation of wealth for the common good, but with little or no regard for the environmental costs of such a policy. The emphasis was on productivity and continually increasing industrialization, and any concerns which conflicted with those goals were brushed aside.² The environment and human safety were two such concerns which were generally not addressed. Starting with Stalin's first five-year plan, introduced in 1928, citizens were encouraged throughout the Soviet era to support massive industrialization based on the view "that nature's wealth is virtually inexhaustible and that it is man's fate to conquer and reshape nature."³ This approach to natural resource use has been appropriately dubbed "gigantomania."⁴ The Khrushchev era saw the development of wilderness areas and attempts to harness the power of some of the Soviet Union's largest

² *Ibid* at 723.

³ Donald R. Kelley, et al., *The Economic Superpowers and the Environment* (San Francisco: W.H. Freeman and Co., 1976) at 135.

⁴ Sergei Zalygin, "A Brief Summary of the Report 'Ideology and Ecology'" (1992) 19 B.C. Envtl. Aff. L. Rev. 635 at 635.

rivers, while the Brezhnev government sustained its profligate spending through unprecedented exploitation of the environment.⁵

There was some recognition in the scientific community during the Khrushchev and Brezhnev years that the country's economic policies might be devastating the environment, but little was accomplished in response to that concern. The government refused to admit to any problems, citing the proposition that pollution would simply never occur in a socialist society, since no citizen would want to burden his or her "brethren" with pollution which it would be the responsibility of the State (meaning the people) to clean up. Since the government declared that pollution could not exist, it certainly could not take responsibility for it by preventing or addressing it.⁶ There is some indication that the government was aware of the existence of pollution but refused to acknowledge it. For example, in September of 1972, the Supreme Soviet devoted an entire session to conservation and pollution problems, but still did not admit to the magnitude of the problems, partly due to the ideological convictions discussed above, and partly due to embarrassment.⁷

2. The Unassailable State

Consciousness of environmental damage, while it existed within scientific circles, was not encouraged in the population as a whole under the Soviet regime for a variety of reasons. First, there was a long tradition of suppressing information about state activity, which extended to environmental concerns. M.C. Millionshchikov, who was First Deputy Chairman of the U.S.S.R Academy of Sciences in the mid-1970s, stated stiffly: "We treat these problems a little differently. Open discussion in the press and in public does not always produce a review of the problem from the right point of view. We try to consider this in scientific discussion, not in public."⁸ All data on pollution was treated as a state secret, and the state-controlled media censored any information on environmental

⁵ Kathleen M. Maloney-Dunn, "Russia's Nuclear Waste Law: A Response to the Legacy of Environmental Abuse in the Former Soviet Union" (1993) 10 *Ariz. J. Int'l & Comp. L.* 364 at 376.

⁶ Moynagh, *supra* note 1 at 726.

⁷ Kelley, *supra* note 3 at 133.

⁸ *Ibid.*

destruction.⁹ An added difficulty was that non-state-sponsored citizen organizations of any kind were prohibited until the late 1980's, making public pressure on the government extremely difficult, if not impossible. Criticism was further precluded in that, where environmental laws and regulations did exist, they were largely unpublished, even at the Union or Republic level.¹⁰ To complete its armour of invincibility, the state was immune from prosecution, even though the state owned most of the U.S.S.R.'s large and potentially polluting industries.¹¹

3. Ineffectiveness of Legislation

The Soviet government did eventually direct its attention to environmental regulation. In fact, by 1987, the Soviet Union had enacted over one thousand pieces of legislation on environmental protection, and the 1977 Soviet Constitution gave paramountcy to environmental values.¹² But legislation was by and large extremely vague and aspirational in nature; one author comments that Soviet environmental laws "served primarily to provide an image of balance and accomplishment for communism" and were not meant to effect any significant change in the system.¹³ Even if there was some genuine willingness on the part of Soviet leaders to discuss solutions to environmental problems, it was countered by the intransigence of potential violators and of local state organizations. The system of production goals and arbitrary deadlines obsessed both factory managers and bureaucrats, who quite regularly sidestepped responsibility for environmental infractions. Information on violations was frequently withheld or falsified so that production quotas could be met.¹⁴ These practices are unsurprising, considering that the fulfillment of production quotas often resulted in bonuses and promotions, while a failure to meet them would likely have caused the loss of an official's job.

⁹ Maloney-Dunn, *supra* note 5 at 385.

¹⁰ *Ibid.* at 386.

¹¹ Moynagh, *supra* note 1 at 729.

¹² Maloney-Dunn, *supra* note 5 at 375.

¹³ Moynagh, *supra* note 1 at 729.

¹⁴ Maloney-Dunn, *supra* note 5 at 385.

4. Structural Weaknesses

The Soviet system contained several organizational faults which made the enforcement of environmental legislation nearly impossible. A multitude of different ministries and agencies were charged with responsibility for environmental compliance, creating a maze of responsibility which often precluded any real leadership. Moreover, the same ministries which were responsible for environmental protection were also responsible for the use of natural resources, so that they acted as "foxes in the hen house," in the words of one Soviet official.¹⁵ That comment was made in 1991, just before the dissolution of the Soviet Union, demonstrating the persistence of these problems into the present decade. Further, the system of centralized monopoly planning which existed in the Soviet Union was such that the same powers that created the laws were charged with enforcing them, so that ministries often violated their own provisions. Enforcement agencies lacked the authority, staff, and independence required to prosecute violators, and the court system was not equipped to punish them.¹⁶ On the rare occasions where polluters were caught by the state, sanctions often involved a stiff fine and some sort of public condemnation. However, fines were usually paid by the state in the end (especially since most large industries were owned by the state), and actual environmental recovery of the sites was neglected.¹⁷

Although *glasnost* (the goal of openness or self-examination) contributed somewhat to opening up public discussion of environmental concerns, and *perestroika* (a program of economic restructuring and decentralization) accelerated the development of environmental laws in the 1980s,¹⁸ the Soviet Union's environmental problems were far from solved.

¹⁵ Kakimbek Salykov, "The Enforcement of Environmental Protection Legislation" (1992) 19 B.C. Envtl. Aff. L. Rev. 581 at 583.

¹⁶ Maloney-Dunn, *supra* note 5 at 384.

¹⁷ *Ibid.* at 387.

¹⁸ *Ibid.* at 384, 386.

III. LINKING ENVIRONMENTALISM AND NATIONALISM: CHERNOBYL AND THE DEMISE OF THE USSR

1. The Chernobyl Disaster

In the days following April 26, 1986, the extent of the inability of the Soviet system to adequately deal with environmental problems was starkly demonstrated to the world. The explosion of one of four reactors at the Chernobyl nuclear power plant in the Ukraine was the greatest peacetime nuclear disaster in history, exceeded only by the bombings of Hiroshima and Nagasaki.¹⁹ The explosion released about fifty tons of radioactive fuel into the atmosphere, deposited seventy tons of fuel in the area immediately surrounding the site, and left a further fifty tons of fuel in the vicinity of the reactor, which would later be enclosed in a concrete sarcophagus. A recent study finds that one hundred million curies of long-lived radioactive fallout were released from the explosion, twice as much as the original estimate.²⁰ Plans were made for the evacuation by 1991 of 189,000 residents of the areas most severely affected, but it took until 1990 for surveys to be completed, showing that 73,000 of those people should indeed be evacuated. Victims of the accident receive special compensation under legislation in the Republics affected; in Russia the amount given was 300 rubles per month as of June 1992, which at that time amounted to \$3.50 (u.s.). This is the equivalent of one-third the minimum monthly pay in Russia.²¹

In the Ukraine, shrinking state revenues have meant that even the meagre benefits originally offered can no longer be provided by the government. For example, those who helped with the clean-up effort after the explosion are theoretically entitled to compensation for medical costs. But the health-care system is in such chaos that these patients are often asked to pay for even the most basic of

¹⁹ L.F.E. Goldie, "Pollution from Nuclear Accidents" in Daniel B. Magraw, ed., *International Law and Pollution* (Philadelphia: University of Pennsylvania Press, 1991) 196 at 213.

²⁰ Mike Edwards, "Living With the Monster—Chernobyl" 186(2) *National Geographic* (August 1994) 100 at 104.

²¹ Robert K. Temple, "Regulation of Nuclear Waste and Reactor Safety Within the Commonwealth of Independent States: Toward a Workable Model" (1994) 69 *Chi.-Kent L. Rev.* 1071 at 1095.

treatments.²² Meanwhile, the official death toll from the accident was thirty-one, but Ukrainian officials have claimed that between six and eight thousand people have died as a result of the accident and cleanup efforts.²³

2. Chernobyl: Metaphor for the Soviet System

The Chernobyl disaster came to be seen as a symbol of all that was wrong with the Soviet system by observers both within and outside the U.S.S.R.. News of the accident spread extremely slowly due to the fact that the plant operators, local government, and the Soviet government each in their turn first denied and then downplayed the seriousness of the event until the evidence of the fallout was too clear to be denied. The central government in Moscow refused to make any statement to the rest of the world until after it had dispatched and waited for the return of a team of experts to Chernobyl to inspect the condition of the reactor. Thus, the terse acknowledgment by the Soviets to the international media that there had been “an accident” at Chernobyl in which “one of the reactors was damaged” did not come until several days after the event had occurred.²⁴ Meanwhile, rain from the radioactive cloud resulting from the accident was falling on many parts of Europe, where governments were oblivious to the danger and did not take preventative actions. Further, personnel at the nuclear plant and a few local government officials were blamed and punished for the accident, while central government officials who committed the equally grave blunder of failing to publicize the accident took no responsibility for their roles in the disaster. In short, one writer has noted that the Chernobyl accident demonstrated “the persistence of the tradition of emphasizing productivity at all costs, of employing secrecy, altering vital statistics, and engaging in scapegoating.”²⁵

²² Quicklaw online newfile CPRE (Canadian Press Recent), Foreign General News, July 27, 1995.

²³ Temple, *supra* note 21 at 1096.

²⁴ Goldie, *supra* note 19 at 212.

²⁵ Moynagh, *supra* note 1 at 727.

3. Environmentalism's Role in Nationalism

The Chernobyl accident occurred at a time when nationalist sentiments in the Republics of the then-Soviet Union were at an all-time high, and when *glasnost* was making it increasingly possible for citizens to speak out against government practices which they saw as unfair. These same conditions brought about the 1991 dissolution of the Soviet Union. Interestingly, many observers believe that there is a strong link between the two events; some even hypothesize that the breakup of the U.S.S.R. can be traced directly back to Chernobyl. The nuclear disaster was a watershed within the republics because "Chernobyl became identified with the duplicity and failure, indeed the complete bankruptcy of the Soviet system as a whole. It also served to mobilize large masses of people against the system."²⁶ The event was one in a long history of examples of the central government's dealings with environmental issues. Often, Moscow had been intent on developing nuclear and chemical plants and other dangerous industries in the republics, without heeding the concerns of local groups or considering other alternatives; this gave rise to localism and distrust of the central government.²⁷

Marshall Goldman hypothesizes that environmentalism and ethnic awakening are very strongly connected in recent Soviet history, and that almost every nationalist and ethnic stirring that occurred during Gorbachev's term of office originated within the environmental movement. During the *glasnost* period, it was natural that those with nationalist tendencies sought out other citizens who had demonstrated a willingness to speak out against the central government. Virtually the only people who had dared criticize the government and who were not in jail as a result were environmentalists, so that it is not surprising that many environmental activists were drawn into nationalist and even separatist factions in the republics.²⁸ Another commentator reports that amongst a conference of Soviet environmentalists from various

²⁶ *Ibid.* at 740, quoting from Roman Solchanyk's introduction to *Ukraine: From Chernobyl to Sovereignty*.

²⁷ Charles M. Haar, "Foreword: A Report on the Bellagio Conference on U.S.-U.S.S.R. Environmental Protection Institutions" (1992) 19 B.C. Envtl. Aff. L. Rev. 481 at 484.

²⁸ Marshall I. Goldman, "Environmentalism and Ethnic Awakening" (1992) 19 B.C. Envtl. Aff. L. Rev. 511 at 511-513.

republics just before the 1991 coup attempt which led to the demise of the U.S.S.R.,

there was a sense that the Center never could overcome its past sins: its exploitation of the nation's environment and natural resources, the ruined health and threatened safety of its citizens, and its disregard of the republics' views. Hence, the breakup of the Soviet Union may have hinged more on environmental dissatisfaction than anyone hitherto had suspected.²⁹

IV. THE PRESENT SITUATION IN THE FORMER SOVIET UNION

1. Environmental Realities

The legacy of the Soviet disregard for environmental protection is summed up in the astonishing fact that close to 180 million ex-Soviet citizens (about twenty percent of the population of the republics) have been said to live in "ecological disaster zones," while another 35-40% reside in "ecologically unfavourable conditions."³⁰ In Russia specifically, scientists have determined that fifteen percent of the land is "ecologically unsafe" for humans.³¹ In 1989, it was found that three-fourths of the surface water and one-third of the groundwater in Russia were classified as too polluted to drink. As a consequence, a 1990 poll found that ninety-eight percent of Muscovites were more concerned with water pollution than with crime, aids, or the drastic food shortages that were and still are a reality.³² As a result of "an unprecedented combination of adverse environmental, economic, and social factors," there has been a record decrease in the average life expectancy of Ukrainian men by ten years and of Ukrainian women by five years in comparison with other industrialized nations. There have also been record increases

²⁹ Haar, *supra* note 27 at 486-487.

³⁰ Maloney-Dunn, *supra* note 5 at 389. Inference from an estimate made in 1989 by Alexei Yablokov.

³¹ Temple, *supra* note 21 at 1071.

³² M. Evelyn Woods, "International Environmental Aid to the States of the Former Soviet Union: A Case Study Focusing On Siberia's Lake Baikal" (1994) 5 *Colo. J. Int'l Envtl. L. & Policy* 459 at 459.

in the number of deaths, cancers, immunodeficiencies, and mental disorders in the Ukraine.³³

2. Economic and Political Burdens

The frightening realities listed above are only a few of the horrors faced by the republics of the former Soviet Union, but these states lack the financial resources and political stability to effectively deal with them. In a state such as the Ukraine, the government's ambitious goals are undermined by the fact that the economy is on the verge of collapse; the ongoing cleanup from Chernobyl consumes approximately fifteen percent of the national budget,³⁴ while hyperinflation is so significant that it threatens to cause social uprisings.³⁵ The Russian ruble, too, declined in value from \$0.008 u.s. in July 1992 to less than \$0.001 u.s. in October 1993, resulting in economic chaos.³⁶ Furthermore, in some republics, there is an ongoing tug of war between former Communist officials who would like to protect the Soviet economic status quo and reformers who would like to see a rapid conversion to a market economy.³⁷

Meanwhile, new political structures in the Commonwealth of Independent States are still in their formative stages. In Russia, for example, regional governments are demanding autonomy, while officials in Moscow are fighting to remain in control of all Russian activities. Incomplete relinquishments of jurisdiction have been the result, which are a source of further confusion and frustration. For example, a 1993 document from the Ministry of Ecology and Natural Resources in Moscow mandated that all proposed foreign investment enterprises involving large-scale construction with the potential to harm the environment be subjected to a state ecological examination. It granted the right to conduct these examinations to the local republic or city government, if the foreign investment involved totaled less than 100 million rubles (about \$58,000 u.s.). However, the central Ministry would conduct any investigations

³³ Yuri Scherbak, "Strategy for Survival: Problems of Legislative and Executive Power in the Field of Environmental Protection in the Ukraine" 19 B.C. Envtl. Aff. L. Rev. 505 at 506.

³⁴ Edwards, *supra* note 20 at 105.

³⁵ Moynagh, *supra* note 1 at 742.

³⁶ Temple, *supra* note 21 at 1105.

³⁷ Woods, *supra* note 32 at 466.

involving larger amounts of investment.³⁸ Local authorities were frustrated by this approach since it meant that the decisions which would undoubtedly have the most significant effect on them would be taken out of their hands and entrusted to a distant central government insensitive to local needs.

The extinguishment of the central government has created other difficulties. One new problem lies in the fact that environmental expertise was traditionally centered in Moscow, but now each republic must acquire the information and expertise necessary to solve environmental problems.³⁹ Further, the republics suffer from the absence of comprehensive legislation on topics such as nuclear or hazardous wastes. During the existence of the Soviet Union, each republic had its own environmental legislation and subordinate acts, but rather than dealing with environmental preservation in a holistic way, the acts regulated resources separately—for example, one statute might deal with water, another with minerals, and yet another with forests.⁴⁰ New legislation which has been created still tends to suffer from the same problems that Soviet legislation displayed: vague terms, a lack of enforcement provisions, and the inability to put it into practice in any case because of financial difficulties.⁴¹ Problems of enforcement stem partly from the fact that many former Soviet officials are still in office in the newly created republics, and find it easy to slip back into corrupt or inefficient practices. Government departments have in many cases not altered their narrow approaches to problems.⁴²

V. THE NUCLEAR INDUSTRY: A CASE STUDY

1. Special Status of the Nuclear Industry in the Former Soviet Union

Perhaps no other topic of environmental concern forms a better case study in the current problems of the Commonwealth republics than the regulation of the nuclear industry. Both the safety of the nuclear

³⁸ *Ibid.* at 466–467.

³⁹ Maloney-Dunn, *supra* note 5 at 417.

⁴⁰ *Ibid.* at 379.

⁴¹ Moynagh, *supra* note 1 at 741.

⁴² Salykov, *supra* note 15 at 583.

reactors and the management of radioactive wastes present problems which are of great magnitude in both national and international contexts. Amongst all of the areas which were subject to Soviet secrecy and propaganda, the nuclear industry was the target of a particularly massive campaign to portray it as completely safe. The nuclear industry was seen as a key element in the industrial superiority of the U.S.S.R. and also formed an obvious cornerstone of the Union's military might during the Cold War era. Today, a sense of reliance on nuclear power is still prevalent in the Commonwealth republics, especially one such as the Ukraine, where there is little or no access to other forms of energy, except through Russia, which no longer subsidizes the provision of oil and gas.⁴³ The political and economic instability in the republics prevent them from improving infrastructure and decreasing reliance on nuclear energy.⁴⁴ If the governments were to close down plants which have a high risk of accidents similar to Chernobyl, they would eliminate precious jobs, which would severely threaten the stability of the government. In these economically desperate times, citizens are more focused on immediate survival than on long-term effects of their actions such as environmental pollution. These economic and political realities contributed to the decision of the Ukrainian government to revoke their earlier promise that they would shut down Chernobyl (whose three functional reactors continued operating after the fourth melted down) by the end of 1993. In spite of the desirability of that goal, the government seemed to have no other choice than to revoke its promise in light of the fact that it claimed that the republic would not have enough energy to get through the winter of 1992-93.⁴⁵ The deadline for closing down the plant has now been set for the year 2000, although even that will be dependent on the government obtaining a certain amount of foreign aid to accomplish the shutdown properly.

2. Nuclear Safety Concerns

Chernobyl is not unique in presenting the risk of another major nuclear accident. In fact, nearly one-half of the twenty-six reactors

⁴³ Moynagh, *supra* note 1 at 743.

⁴⁴ *Ibid.* at 709.

⁴⁵ QuickLaw online newsfile CPRE (Canadian Press Recent), Foreign General News, October 16, 1992.

operating in Russia alone are considered unsafe. Further, all fifty-eight of the Soviet-built reactors in the region have “serious technical and operational flaws that require immediate modification or shutdown.”⁴⁶ Current fears are not only that another major explosion like the one at Chernobyl could occur, but that simple neglect of maintenance of power plants is causing gradual environmental contamination through leakages of radioactive material. It has been stated that Russia’s nuclear power stations “are no less dangerous than nuclear weapons.”⁴⁷ There were 204 recorded “incidents” (one level less dangerous than “accidents” on the International Atomic Energy Agency’s scale of nuclear mishaps), at nuclear power plants in Russia alone in 1992.⁴⁸ In spite of this fact, as late as 1988, twenty-six nuclear plants were scheduled for expansion or construction, and in December 1992, Russia enacted a law planning the construction of at least thirty new nuclear power plants, which would double the nation’s energy capacity by the year 2010.⁴⁹ However, this plan is sharply contradicted by a more recent statement made by Boris Yeltsin, who announced in July 1994 that Russia was closing down the secret nuclear production facility at Krasnoyarsk-26, as the government had “no plans to build up the country’s nuclear potential.”⁵⁰ If this is demonstrative of a change in policy on the part of the government, then it is certainly a positive step towards reducing reliance on nuclear energy in the former Soviet Union.

3. Disposal of Nuclear Waste

A further problematic aspect of nuclear regulation is the disposal of radioactive wastes. This problem has been exacerbated, ironically, by the end of the Cold War and the promises of both the United States and the former Soviet Union to decommission many of their nuclear weapons and submarines. For many years, the Soviets relied on secret dumping of radioactive wastes at a legion of sites in the

⁴⁶ Maloney-Dunn, *supra* note 5 at 390, quoting Thomas Halverson, “Ticking Time Bombs: East Bloc Reactors” Bull. Atom. Sci. (July-Aug. 1993), 43 at 44.

⁴⁷ *Ibid.* at 391.

⁴⁸ *Ibid.* at 398.

⁴⁹ *Ibid.* at 391.

⁵⁰ RFE/RL Daily Report No. 143, 19 July 1994, available at World Wide Web site “<http://solar.rtd.utk.edu/friends/news/refrl/940729.html>”.

Barents and Kara Seas. It was revealed in 1991 that in the thirty years prior to 1982, the Soviets had dumped into these ocean waters roughly twice the amount of radioactivity known to have been dumped by all other nations combined during that period.⁵¹ The material dumped included eighteen nuclear reactors and an atomic-powered icebreaker.⁵² The Soviets also dumped radioactive material into lakes within their own borders. The most startling example of this practice is Lake Karachai, into which raw radioactive materials were dumped beginning in 1951. One Russian scientist claims that the lake contains 120 million curies of radioactivity, and two and a half times as many long-lived isotopes as those released from Chernobyl. As a result, it is estimated that standing on the shores of the lake for as little as half a minute could be lethal.⁵³

4. New Problems Concerning the Nuclear Industry

(i) *Generally*

The nuclear industry poses significant environmental threats not only for the Commonwealth republics but for the rest of the world. It is evident that the fallout from another Chernobyl-style disaster could once again have effects far beyond the borders of the former Soviet Union, and that the use of the oceans as a radioactive sink poses dangers to all nations. However, the economic and political chaos in the new republics also pose new dangers in the context of the nuclear industry which were perhaps not present during Soviet rule.

(ii) *Political Conflicts*

The fall of the central government “left a vacuum of authority in the nuclear arena which republican powers have rushed to exploit.”⁵⁴ Problems of determining responsibility for dismantling weapons and nuclear waste disposal have been worsened by inter-

⁵¹ James M. Broadus, and Raphael V. Vartanov, eds., *The Oceans and Environmental Security: Shared U.S. and Russian Perspectives* (Washington, D.C.: Island Press, 1994) at 126.

⁵² Maloney-Dunn, *supra* note 5 at 392.

⁵³ *Ibid.* at 395.

⁵⁴ *Ibid.* at 403.

republic conflicts over nuclear arms and plants. Squabbles between republics over these issues create dangerous situations which could easily result in environmental disasters with transboundary effects. For example, Ukraine's reactor wastes have traditionally been stored at Krasnoyarsk-26, which is in Russia. But a dispute developed between the Krasnoyarsk combine and the Ukrainian government over the method of payment for butter and sugar normally supplied by the Ukraine, and Krasnoyarsk is now withholding its supply of empty transport casks. As a result, the Ukraine is facing a serious storage crisis.⁵⁵ Security crises could also result from tensions between the new republics; as will be discussed below, the viability of arms-reductions treaties are called into question by the reluctance of republics like the Ukraine to work with Russia, its traditional nemesis, in carrying out the terms of the treaties.⁵⁶

(iii) Trade in Nuclear Materials

A further problem is that poor economic circumstances have forced illicit trade in many objects, including nuclear materials. The sale of nuclear technology to countries such as India, China, and Iran poses the possible danger of new weapons proliferation, even if the sale is purported to be for "peaceful purposes."⁵⁷ As their need for hard currency increases, the Russians have offered to sell their vast reserves of uranium, estimated to be worth between one billion and seven billion dollars (u.s.), to other nations needing reactor fuel.⁵⁸ There is also a growing threat of a nuclear black market, in which private companies offer, for example, to carry out underground nuclear blasts on ex-Soviet territory. A Russian corporation called CHETEK recently wrote to the United Nations offering to rid other countries of their nuclear weapons and wastes by detonating them in this fashion.⁵⁹

⁵⁵ *Ibid.* at 405.

⁵⁶ *Ibid.* at 401.

⁵⁷ *Ibid.* at 406, 412.

⁵⁸ *Ibid.* at 409.

⁵⁹ *Ibid.* at 408-9.

(iv) Nuclear "Brain Drain"

Additionally, there is the question of where the vast numbers of ex-Soviet citizens who were employed in the nuclear industry will go as the industry gradually shrinks. One U.S. estimate stated that 900,000 Soviets worked in the nuclear weapons industry alone. Of these, approximately 2000 are thought to know how to design nuclear bombs; 3000–5000 more have experience in uranium enrichment or plutonium manufacture. Many of these also had top-level security clearance in the Soviet Union. The number of nuclear experts is difficult to estimate, however, because nobody knows exactly how many closed or secret nuclear cities existed in the Soviet Union. Estimates of between 10 and 87 of these cities have been offered. In August 1992, President Yeltsin ordered that 16 Russian regions and cities which produced radioactive materials be closed.⁶⁰ Although Russia has pledged to use special pay raises and incentive packages to keep nuclear scientists within its borders, the economic realities in the country are such that it is unlikely that all of these knowledgeable individuals will resist the temptations of more lucrative international contracts. There are real fears that there will result a massive "brain drain" of nuclear knowledge out of Russia and to countries where commitments to safe, or even peaceful, use of nuclear technology may be much less certain. Accordingly, some feel that the danger of increased nuclear use may soon be greater than it was at the peak of the Cold War.⁶¹ Certainly, the new uncertainty in the former Soviet Union as it affects the nuclear industry poses new security and environmental risks to the world at large.

VI. THE CURRENT INTERNATIONAL REGIME FOR NUCLEAR REGULATION

1. Generally

What does the international regime currently in existence have to offer the states of the former Soviet Union in dealing with the problems associated with the nuclear industry? The new republics, it is evident, will need international assistance in properly regulating

⁶⁰ *Ibid.* at 411.

⁶¹ *Ibid.* at 409.

and cleaning up their nuclear industries, in light of their extraordinarily strained political and economic situations. Moreover, we have seen that the current state of the industry presents clear risks to both the republics themselves and to the broader international community. In spite of this, it is argued that the schemes which exist, including international conventions and organizations, are not currently adequate to deal with the special circumstances of the former Soviet Union. This section will consist mainly of an examination of international nuclear organizations, some of the conventions which have arisen concerning nuclear safety and liability, and the main convention relating to ocean dumping of nuclear waste. It will also briefly touch on two nuclear non-proliferation treaties. This is not intended to be an exhaustive examination of every international instrument which affects the nuclear industry, but rather a look at some key examples which illustrate the strengths and weaknesses of the present regime.

2. International Organizations

(i) Euratom and the IAEA

There are two major organizations which deal with the regulation of the nuclear industry internationally. These are the International Atomic Energy Agency (the IAEA) and the European Atomic Energy Community (Euratom). The former Soviet Union is outside Euratom's geographical mandate; at any rate, Euratom leaves many important regulatory aspects to the IAEA, which has emerged as the dominant agency in the nuclear arena. In fact, the European Parliament stated in a resolution passed after Chernobyl that it hoped that the IAEA would play a more effective role in defining safety standards and that the IAEA was indeed the most suitable body to take on these tasks, since Eastern European states were IAEA members.⁶²

⁶² Elena Molodstova, "Nuclear Energy and Environmental Protection: Responses of International Law" (1994) 12 Pace Envtl. L. Rev. 185, at 259, quoting the European Parliament's 1986 Resolution on the Consequences of the Chernobyl Accident.

(ii) *The IAEA's Mandate*

The IAEA shares responsibility for nuclear activities with the United Nations. As a body set up by the U.N., it is entitled to direct recourse to the Security Council in cases where peaceful cooperation with its directives is in jeopardy. This is a power which has been granted to no other international organization.⁶³ Yet the standards set by the IAEA have no binding legal force, and effectiveness is entirely dependent on cooperation from national governments. The focus of the Agency's work has shifted in recent years from developing standards to actually enforcing standards and guidelines. A reflection of this shift can be found in the development of the "International Chernobyl Project," which has sent over two hundred scientists from twenty-five different countries to the former Soviet Union in the course of fifty different missions. These missions were charged with assessing the environmental and health situations in areas affected by nuclear reactors, and evaluating the measures currently being taken by local officials. The missions provide recommendations on how better to measure radioactive contamination and to protect against it.⁶⁴

(iii) *Difficulties in Enforcing Nuclear Safety*

Elena Molodstova draws a distinction between the effectiveness of programs concentrating on radiation protection (such as the Chernobyl project described above) and those which focus on nuclear safety. The problem with the IAEA's programs in the latter area, she notes, is that they still reflect the Agency's inability to focus on the implementation of nuclear safety standards. This inability derives from the fact that nuclear safety standards are still not widely accepted, which can in turn be partly explained by the fact that such standards are perceived as involving a critique of a nation's scientific, technical and operational success in the field.⁶⁵ In this way, the imposition of nuclear safety programs is more intrusive than the implementation of radiation protection measures, and may be viewed as an infringement on national sovereignty.

⁶³ *Ibid.* at 204.

⁶⁴ *Ibid.* at 210.

⁶⁵ *Ibid.* at 214, 254.

3. Conventions on Nuclear Safety

(i) Generally

Since the accident at Chernobyl, several conventions have been brought into existence which have dealt with the problem of nuclear safety, representing significant improvements to the conventions which existed previously, but an examination of their implementation reveals that they all have significant limitations.

(ii) The 1986 Conventions

The disaster spawned the 1986 *Convention on the Early Notification of a Nuclear Accident*,⁶⁶ a direct result of the concerns of neighboring governments which were not informed of the accident in a timely manner. However, the main limitation of this convention is that although the U.S. and the U.S.S.R. were parties to it, they both made reservations with regard to its mandatory dispute resolution mechanisms. Thus, the effectiveness of the convention is severely limited since an essential enforcement component of it will not apply to the parties who may be those most likely to require it.⁶⁷ In the absence of such a provision, what sanctions can the IAEA apply to a country that fails to give proper notice? It has been noted that withdrawing technical assistance just when a country has demonstrated that it needs it most would be counterproductive for all parties.⁶⁸ A further problem with the Convention is that it is left up to individual countries to determine whether an accident occurring within their boundaries will cause transfrontier pollution.

The response to Chernobyl also included the *Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency*.⁶⁹ However, the scope of this convention as well as that of the Early Notification Convention was so limited that neither one addresses the basic question of nuclear safety. They do not set binding minimum safety standards or reinforce safety regulations; they also do not address the question of whether states which fail to

⁶⁶ 26 September 1986, 25 I.L.M. 1370 (1986).

⁶⁷ Daniel B. Magraw, "International Law and Pollution," in Magraw, *supra* note 19 at 14.

⁶⁸ Goldie, *supra* note 19 at 215.

⁶⁹ 26 September 1986, 25 I.L.M. 1377 (1986).

meet certain safety requirements and thereby cause a nuclear accident can be held liable for resulting damage by other nations.⁷⁰

(iii) State Sovereignty and Nuclear Safety

The reluctance to directly address nuclear safety issues stems in part from fears of a loss of state, sovereignty, which have ensured that international nuclear safety regimes remain in the domain of "soft law." In 1987, the Director General of the IAEA stated that "[i]t is clear that the ultimate responsibility for nuclear safety rests with our member States. Only national authorities have the capacity to establish detailed safety and radiation protection rules and to supervise and enforce their implementation."⁷¹ At the same time, he also recognized the need for greater cooperation between states and the possibility that an international safety regime would become necessary. Similar sentiments were expressed at the International Conference on Nuclear Safety convened in September 1991 in Vienna by the IAEA. There, it was declared that there was a need for an integrated approach which would be adopted by all governments. Again, the basic premise is that national governments are to retain some control over the implementation of an international regime: "states are to retain 'prime responsibility, preeminence, and hegemony in its regulation.'"⁷² The conference also recommended that a framework of independent regulatory organizations be established to ensure the safe use of nuclear power, although this goal has not yet been met.

(iv) The New Nuclear Safety Convention

The *Convention on Nuclear Safety* which arose out of the 1991 conference was opened for signature in 1994.⁷³ One early analysis of it found that it still had many shortcomings in that it dealt with

⁷⁰ Goldie, *supra* note 19 at 215.

⁷¹ Andronico O. Adede, "Overview of Legal and Technical Aspects of Nuclear Accident Pollution," in Magraw, *supra* note 19 at 138, quoting Hans Blix, "The Next 10 Years: Major Challenge Shaping the IAEA's Future" (1987) 29(3) IAEA Bull. 11,12.

⁷² Molodstova, *supra* note 62 at 261, quoting Abel J. Gonzalez, Deputy Director of IAEA Division of Nuclear Safety, "Fundamental Principles of Protection and Safety for Nuclear Power" (1992) 34(2) IAEA Bull. 13.

⁷³ 20 September 1994, 33 I.L.M. 1514 (1994).

nuclear safety and radiation protection together and in too general a manner, and did not specify standards to be met in either area.⁷⁴ However, although it fails to create a clearly binding international regime for nuclear safety, it does establish a system of accountability for nations which may, over time, impose needed global safety standards. Meetings of the parties must be held at least once every three years according to the terms of the agreement, and countries which do not adopt relevant IAEA safety standards will have to explain why they have not done so. It is thought that the international pressure thus generated will be enough to gradually ensure that a minimum level of safety is achieved. The parties to the agreement (which include Russia and the Ukraine) must work toward a legal, regulatory and administrative framework for the nuclear industry within their own countries, and are obligated to entrust the implementation of that system to a regulatory body which is effectively separate from any body concerned with the promotion of nuclear energy. This should be a significant step forward for the former Soviet bloc nations, in which nuclear regulatory agencies have traditionally been dominated by officials with a vested interest in the status quo in the nuclear industry.

4. Conventions on Nuclear Liability

(i) The Paris and Vienna Conventions

The oldest conventions relating to the nuclear industry are concerned with questions of liability. The Paris⁷⁵ and Vienna⁷⁶ Conventions on liability for nuclear damage provide that individual operators will be liable for damage to or loss of life or property resulting from an incident at their nuclear installations. The two conventions were substantially the same but had different signatories. They have recently been reconciled so that a party to one of the conventions can be liable to a signatory of the other,

⁷⁴ Molodstova, *supra* note 62 at 262.

⁷⁵ *Convention on Third Party Liability in the Field of Nuclear Energy*, 29 July 1960, (1961) 55 Am. J. Intl. L. 1082.

⁷⁶ *Vienna Convention on Civil Liability for Nuclear Damage*, 21 May 1963, 2 I.L.M. 727 (1963).

through the Vienna Protocol.⁷⁷ The glaring problem with these conventions is that essential states, including Russia and the Ukraine (or the U.S.S.R., at the time of the conventions' creation), are not party to the agreements.

(ii) Significance of the Liability Issue

The liability issue points up the competition between the values of state sovereignty and of international cooperation. Some argue that the present lack of effective liability schemes should be replaced by a fairly strict system of international strict liability for nuclear damage. This argument is supported by the view that "international strict liability functions as an essential corrective to the socioeconomic imbalance which inevitably arises between those States that engage in transnationally hazardous activities and those that do not yet [but] are exposed to the risks created by others."⁷⁸ While this "deep-pockets" justification may seem appropriate in the context of offending states such as the U.S., it is doubtful whether it has any application to financially bereft states such as the ones in the former Soviet Union. On the other hand, it is interesting that during the aftermath of Chernobyl, many states such as West Germany, which could justifiably have brought claims for damage against the U.S.S.R., did not do so. Many feel that the reluctance to press such claims was the result of the knowledge that many other countries were in the same position as the Soviet Union was; an accident like Chernobyl could just as easily have happened in West Germany, and it still could happen in many countries outside the CIS. Thus, countries were "not very willing to throw stones at other glass houses" for fear of creating "normative boomerangs" which could come back to haunt them if a catastrophe were to eventually occur on their own territory.⁷⁹ This could even be an indication that the acceptability of nuclear damage is actually rising in the

⁷⁷ Bowman, *Multilateral Treaties: Index and Current Status*, 11th Cumulative Supplement (Nottingham: University of Nottingham Treaty Centre, 1995), summarizing the Joint Protocol Relating to the Application of the 1963 Vienna Convention and the 1960 Paris Convention, 21 September 1988.

⁷⁸ Gunther Handl, "Paying the Piper for Transboundary Nuclear Damage: State Liability in a System of Transnational Compensation," in Magraw, *supra* note 19 at 164.

⁷⁹ Ian Brownlie, "State Responsibility and International Pollution: A Practical Perspective," in Magraw, *supra* note 19 at 123.

international community, contrary to what would seem to be the logical reaction.

5. Ocean Dumping Convention

As noted above, regulation of marine dumping of radioactive wastes is also an important aspect of the control of the nuclear industry. With the entry into force of the London Dumping Convention (now called the London Convention 1972),⁸⁰ the marine disposal of high-level radioactive wastes was prohibited under international law. Further, a voluntary moratorium on low-level radioactive ocean dumping was entered into by the parties in 1983 and again in 1985. In 1993, that moratorium was converted into an initial twenty-five year ban, subject to scientific study and review at that time.⁸¹ The effectiveness of these types of agreements is called into question by the fact that in both 1983 and 1985, the U.S. voted against the voluntary moratoria and the U.S.S.R. abstained from the vote, claiming simply that it had never engaged in such dumping and had no plan to do so in the future. That this was nothing short of a lie was revealed in 1991, as mentioned above, when the Soviets revealed their history of marine dumping. It became evident that the dumping had been in violation of several international agreements, including the original London Convention and the two voluntary moratoria.⁸² Again in 1993, Russia abstained from the vote to ban low-level radioactive dumping (along with Belgium, China, France, and the United Kingdom), and provided the parties with formal notice of its nonacceptance of the ban and of its simple inability to comply with it.⁸³ This amounts to a concession by the Russian government that its facilities for dealing with radioactive waste are so inadequate as to leave them no satisfactory alternative to continued ocean dumping of low-level liquid wastes in the near future.⁸⁴

The international reaction to the revelation of Soviet dumping in 1991 provides another interesting example of the difficulties of

⁸⁰ *Convention on the Prevention of Marine Pollution by the Dumping of Wastes and Other Matter*, 1140 U.N.T.S. 377.

⁸¹ Broadus and Vartanov, *supra* note 51 at 154.

⁸² *Ibid.* at 134.

⁸³ *Ibid.* at 149.

⁸⁴ *Ibid.* at 134.

sanctioning nations for the violation of agreements such as the London Convention. Although Norwegian Prime Minister Gro Harlem Brundtland (whose environmental awareness can surely not be doubted) stated that the practice constituted a security risk to the people and natural biology of Northern waters, the only sanction which was used was the imposition of a ban on Russian nuclear icebreakers preventing them from picking up tourist passengers at Norwegian ports!⁸⁵ Surely there are sanctions which would be more deterrent, but there is little latitude for employing them in a situation where the violating country has so few resources to deal with the problem in the first place.

6. Nuclear Non-Proliferation Treaties

Nuclear non-proliferation treaties have also presented new problems in the aftermath of the Soviet Union's breakup. As an example, the Ukraine is now the world's third largest nuclear power, since it inherited 1800 strategic nuclear warheads from 176 intercontinental missiles and from air-launched cruise missiles from the Soviet Union.⁸⁶ These warheads are reported to be poorly maintained and decaying. The international community has pressured the government to give up this stockpile of weapons, to which the Ukraine had responded that it should receive approximately three billion dollars (u.s.) in foreign aid in return.⁸⁷ The Ukrainian Parliament finally ratified the START I⁸⁸ arms reduction treaty in February 1994, after a long political struggle. Since it had initially imposed a long list of conditions to its compliance with START I, it is unclear whether the Ukraine's ratification will mean full compliance or not.⁸⁹ And after an even more concerted campaign of international pressure, the Parliament ratified the Nuclear Non-

⁸⁵ *Ibid.* at 149.

⁸⁶ Linda A. Malone, "Discussion in the Security Council on Environmental Intervention in Ukraine" 72 *Loy. L.A. L. Rev.* 893 at 893.

⁸⁷ *Ibid.*

⁸⁸ Treaty between the u.s. and the u.s.s.r. on the Reduction and Limitation of Strategic Offensive Arms, July 31, 1991. See *The START Treaty: Report of the Committee on Foreign Relations, United States Senate* (Washington: u.s. Government Printer, 1992).

⁸⁹ Malone, *supra* note 86 at 893.

Proliferation Treaty (NPT)⁹⁰ in December of 1994. The Ukraine's reluctance stems in part from the fact that it has been asked to relinquish its weapons to Russia, which has historically been its aggressor and occupier. Its decision to ratify the NPT was conditional upon promises of security from the U.S. and Russia, but Ukraine's compliance with the treaty would undoubtedly be jeopardized should the government feel threatened in any way by Russia.⁹¹ A plan with more foresight would perhaps have envisioned the weapons being turned over to a neutral international body rather than to a republic that the Ukraine sees as a potential threat to its own future security. These examples provide a basic overview of some of the problems with the limited scope and enforcement capabilities of existing international regimes in the nuclear arena.

VII. CURRENT SOURCES OF FUNDING FOR NUCLEAR CLEANUP

1. Current Funding Structure

It is clear that the countries facing the most severe problems of nuclear cleanup and safety improvement need vast amounts of money to accomplish these goals. In the case of the republics of the former Soviet Union, these resources simply do not exist within the countries, so that the aid of the international community is desperately needed. As has been discussed, it is in the long-term interests of foreign governments to provide such funding. Presently, funding is made available to the states of the CIS on a piecemeal basis and without any central coordination. Although there have been many unilateral and multilateral efforts to aid the Ukraine, for example, they seem to reflect the specific priorities of the donor agencies or countries, and each package only addresses a limited part of the overall problem. For instance, there is a British fund to help the Ukraine develop the technology to restore contaminated land; the U.S. has pledged to help upgrade safety standards at plants and train operators; and the European Union has funded the

⁹⁰ *Treaty on the Non-Proliferation of Nuclear Weapons*, 1 July 1968, 7 I.L.M. 809.

⁹¹ QuickLaw online newsfile CPRE (Canadian Press Recent), Foreign General News, December 5, 1994.

continued treatment of ongoing medical problems resulting from the accident.⁹² Many of these aid packages have been motivated by desires that are “anything but altruistic....[A]ll are at least partly motivated by a self-interested desire to be rid of the transboundary effects of Russia’s pollution.”⁹³ Meanwhile, there has been no comprehensive plan to address both the structural problems at the root of disasters such as Chernobyl and measures to be taken in case of another crisis.

2. The G-7 and the European Community

Major sources of funding include the G-7 and the European Community (EC). A few years ago, the EC pledged to provide \$550 million of the \$700 million that was recommended by the G-7 to address urgent nuclear safety needs through 1994. It also sent the first-ever on-site international team to the Ukraine and Russia (although it demanded legal indemnification from the two states in case of an accident during this mission since neither the Ukraine nor Russia signed the Paris and Vienna Conventions on nuclear plant operators’ liability, as discussed above).⁹⁴ However, this amount must be paltry in relation to the total amount which would be needed to do a complete job of ensuring permanent reasonable levels of safety of the nuclear industry in the former Soviet Union. Even after the above EC commitment was made, the Ukraine still claimed at the G-7 meeting in July 1995 that it needed more than four billion dollars (Cdn) in order to shut down Chernobyl alone.⁹⁵ The Ukraine’s Environment Minister placed the cost of shutting down Chernobyl at about \$5.4 billion (Cdn),⁹⁶ which would include the cost of building a gas-fired replacement energy plant, erecting a safer sarcophagus around the ruined reactor, managing radioactive waste near the plant, and providing some type of alternative work for the 12,000 employees who still depend on

⁹² Moynagh, *supra* note 1 at 749.

⁹³ Woods, *supra* note 32 at 471.

⁹⁴ Maloney-Dunn, *supra* note 5 at 415.

⁹⁵ QuickLaw online newsfile CP95 (Canadian Press 1995), Foreign General News, June 9, 1995.

⁹⁶ QuickLaw online newsfile CP95 (Canadian Press 1995), Foreign General News, May 17, 1995.

Chernobyl for their livelihoods.⁹⁷ The sheer amounts of money that will be required over the long run will undoubtedly be staggering.

Meanwhile, other funds which the EC administers would, at first glance, seem to be perfectly applicable to the present crisis in the nuclear industry in Eastern Europe. For example, the PHARE and TACIS⁹⁸ funds have been set up to aid in the rebuilding of states recovering from the grip of communism. The TACIS provisions seem comprehensive, but upon closer examination, they do not allocate any aid specifically for environmental protection projects in the beneficiary states. However, "energy and nuclear safety" is one of the prescribed areas, so there may be some hope that aid focused on nuclear safety will be forthcoming.⁹⁹

3. Effectiveness of Funding Programs

It seems that proposals to aid the republics of the former Soviet Union often are discussed but do not materialize, or are not as useful as they could be. A spokesman for the Russian ministry in charge of the nuclear industry has complained that foreign governments have thus far delivered little more than promises, dozens of delegations, and plenty of unfriendly advice.¹⁰⁰ On a 1991 mission to the U.N. to solicit aid to deal with the aftereffects of the Chernobyl disaster, the Ukrainian minister in charge of the effort expressed frustration with the fact that U.N. members seemed more concerned with current crises and were apathetic toward the Chernobyl cleanup since they perceived the event as something that had happened long in the past. This view, if it was indeed the prevalent one, is both inaccurate and extremely dangerous. It is made more perilous by the fact that many of the effects of the disaster (such as the long-term health effects on the survivors, and the viability of the sarcophagus surrounding the ruined reactor) are as yet unknown.¹⁰¹ The actual effect of bilateral aid agreements is also difficult to assess. For example, a 1993 article pointed out that

⁹⁷ QuickLaw online newsfile CP95 (Canadian Press 1995), Foreign General News, June 9, 1995.

⁹⁸ Council Regulation No. 2053/93 of 19 July 1993 Concerning the Provision of Technical Assistance to Economic Reform and Recovery in the Independent States of the Former Soviet Union and Mongolia, OJ (L 187).

⁹⁹ Woods, *supra* note 32 at 473-474.

¹⁰⁰ Maloney-Dunn, *supra* note 5 at 399.

¹⁰¹ Monagh, *supra* note 1 at 710.

less than five percent of the \$800 million which the U.S. Congress had designated up to that date for nuclear aid to Russia had been formally obligated through signed contracts, and even less had actually been spent.¹⁰²

Indirect sources of aid may also be less dependable than they appear. For example, the IAEA has experienced budget problems recently and announced in February 1992 that it would have to postpone or cancel some important projects, which included research into safe methods of handling nuclear waste.¹⁰³ Overall, the funding picture for nuclear recovery in the CIS seems patchy and provides no guarantees that aid will actually be effective. This is not to say, however, that there is no hope; the number and varied types of aid proposals do signal that the concern of the international community is very real.

4. Developed or Developing?

In order to improve funding schemes, the international community must answer the crucial question of how the states of the former Soviet Union should be classified in terms of economic status. Should they be considered developing countries, and thus be made eligible for such programs as debt-for-nature swaps? The problem with classifying the republics as "developing" is that although they are experiencing many of the same economic hardships faced by developing countries, they are fundamentally different from Third World nations in that they possess a vast industrial base, more complex environmental problems resulting from the presence of those industries, and a relatively sophisticated pool of scientific and technical knowledge within their borders. Thus, many international agencies, such as the Global Environment Facility and the European Community, have decided that the states of the former Soviet Union are not eligible for aid directed at developing nations.¹⁰⁴ Countries in transition from socialism are "repeatedly overlooked for environmental aid in favor of the developing nations in Asia and Latin America."¹⁰⁵ Russian representatives at the 1992 Rio Earth Summit succeeded only with great difficulty in seeing that the

¹⁰² Maloney-Dunn, *supra* note 5 at 413–414.

¹⁰³ *Ibid.* at 415.

¹⁰⁴ Woods, *supra* note 32 at 475.

¹⁰⁵ *Ibid.* at 474.

phrase "countries with an economy in a transitional mode" was incorporated into conference documents.¹⁰⁶ It is extremely important that the international community realize quickly that these countries fall into a unique category with urgent needs as far as economic development is concerned. Interestingly, some experts feel that Russia may have the world's highest ecological efficiency of capital investments,¹⁰⁷ probably because of its combination of severe ecological problems, shortage of financial resources, and scientific capability to effect change once funds are made available. Therefore, if the international community neglects to direct aid to states with transitional economies, they may be overlooking "the wisest investment of their funds."¹⁰⁸

VII. PROSPECTS FOR THE FUTURE

1. The Need for Action at All Levels

It is evident that the states of the former Soviet Union need help at the international level. Documents such as Agenda 21 demonstrate the clear commitment of the international community to eventually find solutions to the problems of nuclear safety and the management of radioactive wastes.¹⁰⁹ However, it is equally clear that the regulation of the nuclear industry requires legislative attention within the republics before international instruments can become fully meaningful or functional. As Patricia Birnie stated in a general work on international environmental law, "the law does now

¹⁰⁶ *Ibid.* at 474-475.

¹⁰⁷ *Ibid.*

¹⁰⁸ *Ibid.*

¹⁰⁹ *Report of the United Nations Conference on Environment and Development*, UN Doc. A/CONF.151/26 (Vol. II), 13 August 1992. Reprinted in Stanley Johnson, *The Earth Summit* (London: Graham & Trotman/Martinus Nijhoff, 1993). For example, Chapter 22 of Agenda 21 is devoted entirely to the safe and environmentally sound management of radioactive wastes. It calls for international and regional cooperation on the subject, including the replacement of the voluntary dumping moratorium under the London Convention 1972 with a complete ban, which was accomplished in 1993, as discussed above.

provide many tools; it remains for states to get on with the job."¹¹⁰ This feeling is echoed in the statements of the EC as well; an EC representative stated, in relation to funding from sources such as TACIS, discussed above:

The countries of central and eastern Europe can count on considerable support from the European Community. But if the countries do not themselves integrate sustainable development and nature conservation objectives into their own national policies, it will be very difficult for the Community to assist.¹¹¹

The need for cooperation has been called for in many contexts. It has been said that cooperative action is required, for instance, to improve "the existing patchwork of national, regional, and global control regimes aimed at marine radioactivity."¹¹² This cooperation would necessarily involve a harmonization of rules and laws between and among national jurisdictions and at the international level, as well as the development of multilateral programs concentrating on recovery, cleanup, enforcement of standards, and liability for damage caused by contamination. But, many feel harmonization must not go too far: Because laws in a given jurisdiction must be finely tuned to the populations for which they are designed, it is dangerous to try and homogenize them on an international level. There is even concern that such a harmonization would result in the lowest common denominator being adopted by countries during the process of negotiations, so that the standards of many countries would actually drop.¹¹³

However, in the context of nuclear safety, it is manifest that certain minimum standards must be enforceable across a large number of jurisdictions in order for the international community to have some sense of security. It is essential that nations be encouraged to adopt internal laws incorporating such minimum

¹¹⁰ Patricia Birnie, "The role of international law in solving certain environmental conflicts," in John E. Carroll, ed., *International Environmental Diplomacy* (Cambridge: Cambridge University Press, 1988) 95 at 118.

¹¹¹ Laurens J. Brinkhorst, "Closing Remarks to the Conference," in Graham Bennett, ed., *Conserving Europe's Natural Heritage: Towards a European Ecological Network* (London: Graham & Trotman/Martinus Nijhoff, 1994) 281 at 282.

¹¹² Broadus and Vartanov, *supra* note 50 at 161.

¹¹³ Molodstova, *supra* note 62 at 256.

standards, but it must also be recognized that the full scope of the law should be determined by the individual country, thus respecting the decision-making sovereignty of that state. Advice of nations more advanced in environmental protection must not devolve into paternalism; suggestions will be rejected by states if they are born of good intentions but not of thorough knowledge of local conditions.¹¹⁴ The importance of local input was recognized in an article concerning the future of Lake Baikal, a national treasure in Siberia which has become notoriously contaminated as a result of the industrial development on its shores. The concept might apply equally to, for example, an area with a nuclear facility in its midst. The author suggested that

[t]he people of Baikal who have lived with the lake for generations understand it best and ought to be allowed to decide its fate....the international environmental community should merely offer its technological and legal expertise and funding, leaving ultimate decisions to the people who live around the lake. Local people should both form the laws and comprise the body that enforces them.¹¹⁵

2. Positive Steps in National Legislation

(i) Generally

Thus far, the new republics of the CIS have taken some positive steps toward enacting legislation which will enable them to tackle the cleanup and continued regulation of nuclear industry in an effective manner. Russia will be examined as the most accessible (and, it would seem, the most advanced) of the republics in this area.

¹¹⁴ Michael Bothe, "The Impact of International Law on the Protection of the Environment in Amazonia and Siberia," in Michael Bothe et al., eds., *Amazonia and Siberia: Legal Aspects of the Preservation of the Environment and Development in the Last Open Spaces* (London: Graham & Trotman/Martinus Nijhoff, 1993) 237 at 255.

¹¹⁵ Woods, *supra* note 32 at 476-477.

(ii) *The Law on Protection of the Environment*

In a general vein, the Yeltsin government adopted the Law on Protection of the Environment (LPE) in late 1991.¹¹⁶ It establishes a command-control system of environmental regulation and defines areas of responsibility for central, provincial, and local governments. However, law enforcement is still at a very low level of effectiveness, and the LPE is merely a framework which requires regulations which will eventually set actual standards and enforcement mechanisms. Although regulations in several areas have been enacted pursuant to the LPE, they have come amongst a flood of new legislation in the federation, and enforcement resources will undoubtedly be allocated to other subjects with higher priority than the environment, at least in the near term. There are also many ambiguities and even contradictions in the regulations, since regulations for each subject area were enacted separately and at different times. The new legislation also requires a complete overhaul of the judicial system and the retraining of lawyers to deal with the statute.¹¹⁷ Even where convictions are obtained, most debtors cannot pay their fines anyway; and if they can, there is little deterrent effect because many enterprises find it more profitable to simply pay their fines than to clean up their technology. These problems are reminiscent of the problems which existed in the Soviet Union. There is still a sense that it would be unwise to charge businesses the real cost of the damage that they cause to the environment, because in that case, "Russia would have to 'let go' half its industry, if not more."¹¹⁸ Another source suggests that if the law was strictly enforced, it would require the immediate closure of eighty percent of Russia's factories.¹¹⁹

(iii) *The Proposed Nuclear Waste Law*

A second piece of legislation proposed by the Russian Parliament in 1992, was more specifically directed toward the regulation of

¹¹⁶ Law on environment protection 92-12-601, Russian Federation, Dec. 19, 1991, cited in Woods, *ibid.* at 464.

¹¹⁷ Maloney-Dunn, *supra* note 5, at 420.

¹¹⁸ Woods, *supra* note 32 at 466.

¹¹⁹ Maloney-Dunn, *supra* note 5 at 420.

nuclear waste.¹²⁰ The objective of the proposed Nuclear Waste Law is “to ensure the safety of the population and the protection of the environment ‘through the safe isolation of radioactive wastes, which prevents them from entering the environment during collection, treatment, transportation, storage and burial.’”¹²¹ The proposed law, which was drafted with the help of American groups, represents significant progress in encouraging the free flow of information about the nuclear industry within the country and involving the public in decisions on nuclear safety. It also envisioned a system in which all handlers of nuclear waste would be required to be licensed by the state, vastly improving the probability that the government could exercise effective control over those handlers. The proposed law also stated that approved environmental assessments would be required before storage facilities and repositories could be sited; the required process even included public hearings. A final section of the proposed law articulated the state’s intent to take measures consistent with international law, and with a view towards international cooperation on nuclear subjects.¹²² However, political struggles over the breadth of the Nuclear Waste Law have followed its proposal, and in late 1993, President Yeltsin abolished the Russian Parliament before the bill had been enacted. It is to be hoped that the proposed Nuclear Waste Law will serve as a prototype for future comprehensive legislation.¹²³ Unless the republics of the former U.S.S.R. move forward with the passage of laws similar to this one, which attempt to significantly improve the regulation of environmental matters, there will be little hope that the international community will blindly pour urgently needed funds into the republics.

¹²⁰ *Ibid.* at 368. A Lexis online country file search, current to December 1, 1995, also showed no record that the law had been passed.

¹²¹ *Ibid.* at 425. Quoting Draft Law of the Russian Federation, “On State Policy for Handling Nuclear Waste,” 1992.

¹²² *Ibid.* at 425–428.

¹²³ No record that such a law had been passed in Russia was Found in a Lexis online country file search current to December 1, 1995.

3. The needs of the international community

(i) *Generally*

Before it will be willing to truly commit to thoroughgoing assistance of the magnitude that is required in the CIS, the international community will need to be assured of certain improvements in the current nuclear situation there. The outside world will demand the knowledge that there is a strong internal system of laws, ensuring that compliance with minimum standards will be a realistic goal, as discussed above. Another concern which the IAEA has already partly addressed is the lack of information surrounding the nuclear industry in the former Soviet Union which so impeded the international community's response to the Chernobyl disaster. The Early Notification agreement, discussed previously, does make progress in this area, but work still needs to be done in order to find a dispute resolution mechanism which will be acceptable to all parties. An additional goal which is closely linked with better notification systems is the internationalization of scientific and technical research in the nuclear realm, which would benefit all nations in that it would eliminate duplication of research and speed up the progress of improvements to, for example, unsafe reactors. The problem of potentially dangerous reactors is certainly not limited to the former Soviet Union, so many countries using nuclear technology would be aided by more open communication.

(ii) *Resolution of Liability Issues*

The international community also needs an indication that states will accept some responsibility for damage caused by nuclear incidents. The liability issue is a sensitive and complex one; it is evident that some solution is needed, not just in the context of long-range effects of accidents such as Chernobyl, but so that scientific aid and safety inspection missions can safely be sent to the CIS to work on nuclear reactors there. The nuclear industry in the West has indicated its willingness to help in retrofitting reactors to make them more safe, but this has been on condition that it will be indemnified against claims for compensation if damage was caused at plants where their supplies or services have been used.¹²⁴ It is seen as important by many that operators of nuclear facilities be

¹²⁴ Malone, *supra* note 86 at 902.

personally tied to the failure to operate safely, in order to encourage a higher level of compliance with international standards. This type of liability, it has been suggested, should also extend to minimum security standards at nuclear facilities, which would help calm international fears about access to nuclear materials by, for example, terrorists.¹²⁵

It must be recognized that many of the desires of the international community are, indeed, somewhat selfish ones, but this must be accepted as a fact of life: whether their motives are altruistic or not, they are being driven to aid the situation in the CIS, which can benefit all nations in the long run. However, the international community must also strive not to engage in paternalism or coercion; cooperation must be encouraged, as well as the recognition of a respectable level of state sovereignty.

4. The needs of the CIS republics

(i) *Effective Aid with Local Input*

As has already been noted, the new republics need to have their sovereignty respected, and local and regional authorities must be involved in the creation of new legal norms in order for any regime to be ultimately successful. At the same time, vast amounts of money from foreign sources and technical assistance are desperately needed. Donors of aid should allow the national governments some discretion in deciding how the money which they receive should be spent, and yet it is to be hoped that there could be some measure of certainty that the money would be used for effective projects. One possible solution to this conundrum is that, in the initial stages at least, aid packages should emphasize the training or retraining of personnel within the republics and the provision of necessary technology with a view to the hope that the countries could eventually, given such tools, carry out measures themselves.¹²⁶

(ii) *Strengthening International Institutions*

A former member of the Soviet Congress of Peoples' Deputies suggested that the focus should be not on economic aid but on the strengthening of international institutions for environmental

¹²⁵ Temple, *supra* note 21 at 1116–1117.

¹²⁶ Moynagh, *supra* note 1 at 750.

protection. For example, he proposed that an international ecological school be created and promoted, and that an international environmental inspection system and tribunal should be established.¹²⁷ These suggestions would indeed be particularly useful in the context of the nuclear industry. There are private, non-profit organizations in existence which are independently striving towards the goal of providing effective technical assistance; one such organization is ECOLOGIA (Ecologists Linked for Organizing Grassroots Initiatives and Action). This organization was founded in 1989 in order to support grassroots environmental organizations in the former Soviet Union, and has now expanded its mandate to offer "technical and humanitarian assistance to people of those nations emerging from the ecological effects of Soviet history."¹²⁸ Although the organization was started by American grassroots activists, it seeks to recruit local scientists and activists of the highest calibre in each of the areas where it does its work, so that it is not perceived as a foreign element lacking understanding of local issues. It focuses not on political assistance to NGOs within the former Soviet Union but on providing access to high-quality monitoring equipment and a wide range of technical information services. In this way, they hope to fill a unique (and likely very wide) niche in the states of the former U.S.S.R..

Another organization, this one sponsored by the American government, was proposed during the Bush years. The Regional Environmental Center for Central and Eastern Europe supports information collection and dissemination, institution building, emergency preparedness, and environmental education work. It is also engaged in providing support in the areas of environmental health, energy efficiency, pollution prevention, and agriculture. The Center also claims to be creating and strengthening links between government, business, and environmental groups, a goal which is of unquestionable value in promoting environmental progress.¹²⁹ It is suggested that more organizations such as these are needed, perhaps

¹²⁷ Zalygin, *supra* note 4 at 636.

¹²⁸ Ecologia Mission Statement, available online at World Wide Web site "<http://ecologia.nier.org/english/level1/ecoabout.html>".

¹²⁹ William K. Reilly, "International Cooperation on the Environment: The Cleanup of Eastern Europe" (1992) 19 B.C. Env'tl. Aff. L. Rev. 501 at 504.

with a focus on the nuclear industry and utilizing the monetary resources of the IAEA (and thus the U.N.).

5. A New Central Nuclear Authority

The need for greater coordination among the republics of the former Soviet Union has been noted many times. Even during the Soviet period, coordination between the various levels of government was a constant struggle and made the regulation of the nuclear industry extremely difficult. However, now that the central Soviet government is gone, there is an even greater vacuum of coordination. Robert Temple suggests that the most workable method of achieving nuclear regulation in the CIS lies in the creation of a central nuclear authority.¹³⁰ Although the IAEA can perform a coordinating role to a certain extent, it has not yet demonstrated the ability to do so in a way which is particularly well-suited to the region in question. An organization similar to Euratom could be established, with a geographical focus on the former Soviet Union, and it could work in tandem with the IAEA as does Euratom. Such an organization is urgently needed in order to focus on the problems which are unique to the nuclear industry in the CIS, and to create more specific solutions, tailored to the needs of individual countries and regions, than an international agency could. It could organize the support which the republics urgently need, including scientific, technical, informational, and financial aid. Donor countries and organizations would feel more secure in contributing funds and effort to the cause of cleaning up the post-Soviet nuclear mess if they knew that a central body was engaged in coordinating that money and effort. Fears of redundant or imprudent use of resources would ideally be eliminated. The creation of a central authority would allow for the prioritization of resources which become available in order to ensure that the most urgent problems get solved first.¹³¹

At the same time, such an approach would also allow for some resources to be allocated to the root causes of the problems, such as improving administrative law structures and developing alternative energy sources, which may not be targeted as important goals by donors which are farther removed from the CIS. A holistic approach

¹³⁰ Temple, *supra* note 21.

¹³¹ *Ibid.* at 1112.

to the problems, which is presently lacking, could thus be achieved. The creation of a central agency would also be much more cost-effective, Temple notes, than having each republic create the support network necessary to oversee cleanup efforts.¹³² The central organization should, as far as possible, be apolitical, so as to alleviate fears of bias or domination by a particular state in the allocation process. It should involve environmental activists, scientists, and public representatives from each region involved.

IX. CONCLUSION: THE SYNTHESIS OF COMPETING PHILOSOPHIES

1. Generally

In seeking the solutions outlined above, the goal of achieving sustainable development for all nations of the world may often conflict with the desire of individual states to retain some degree of sovereignty over their own affairs. A closer examination of these points of view reveals some of the underlying issues in the struggle which is unfolding in the regulation of the nuclear industry.

2. Recognition of Ecological Sovereignty

First, the reality in the states of the former Soviet Union is that "[e]cological sovereignty has become an integral part of the idea of state sovereignty in every republic."¹³³ In fact, each republic adopted a declaration of sovereignty in 1990, and each of these documents affirmed the right of the republic to control its own natural resources and environmental protection measures.¹³⁴ Earlier in the paper, the manner in which ecological concerns became identified with nationalist causes in the republics was outlined. It is clear that particular sensitivity must be shown to the CIS states in approaching questions of international environmental regulation, and that the nuclear industry must be dealt with especially carefully in light of its economic importance to the republics.

¹³² *Ibid.* at 1119.

¹³³ U.S. Shemshuchenko, "New Tendencies in the Development of Legal Protection for the Environment in the Republics" (1992) 19 B.C. Envtl. Aff. L. Rev. 515 at 515.

¹³⁴ *Ibid.*

3. Attacking the Deeper Problems

Because of the fragile political and economic situations in the CIS, it must be recognized that environmental concerns will not always be given priority by national governments. At present, Russians, for example, are less concerned with the environment than with the botched war in Chechnya, charges of corruption among high-ranking government officials, the break-neck pace of economic reforms, and the failure of the government to pay wages and pensions on time. These are issues which have placed Boris Yeltsin a distant fourth or fifth in most opinion polls regarding the presidential election to be held in June, 1996.¹³⁵ These same issues are also the basis of the Communist Party's tremendous resurgence in popularity and could lead to the election of its leader, Gennady Zyuganov, as President. It is unclear what, if any, priority would be given to environmental issues by the Communist Party if it were elected.

It is true that "sustainable development is possible only where there is no urgent and immediate need for non-sustainable development."¹³⁶ In other words, if nations are not given aid to restructure basic economic and political systems which are causing inefficiency and hardship, there can be no progress on the environmental front. Thus, international aid must address broader problems at the same time as it looks at environmental questions. This is not to say, however, that environmental work can or must wait until after the political and economic picture is stabilized. This is particularly clear in relation to the nuclear industry, where the environmental risks are enormous and growing more serious with each passing day. As one author pointed out, a long series of decisions to put off environmental restoration until after the economy was fully recovered are a product of precisely the type of thinking which got Eastern Europe into the environmental mess in which it presently finds itself.¹³⁷ In fact, economic cost-benefit analyses only form a part of the justification for taking environmental action; there is also a higher ethical imperative to

¹³⁵ "Yeltsin decides to seek second term," *The Globe & Mail* (16 February, 1996).

¹³⁶ Bothe, *supra* note 114 at 253.

¹³⁷ Reilly, *supra* note 129 at 502.

promote the survival of the human species by correcting the imbalance between nature and humankind.¹³⁸

4. Sovereignty and Sustainability

The desire to achieve global environmental sustainability is often cited as cause for imposing international minimum standards on activities, such as the nuclear industry, which pose significant risks on a global basis. While it is important to recognize state sovereignty, the international community must decide how many of the crucial decisions relating to the nuclear industry can safely be left up to national governments. The challenge facing individual nations in balancing their own interests with those of the international community is symbolized by two elements found within a single key provision of the 1992 Rio Declaration.¹³⁹ Principle 2 of the Declaration provides that states have the sovereign right to exploit their own resources "pursuant to their own environmental and development policies." However, that right is qualified by the obligation to ensure that "activities within their jurisdiction and control do not cause damage to the environment of other states or of areas beyond the limits of national jurisdiction."

The obligation upon nations to remain environmental "good neighbors" converges with the fact that sound environmental decisions will be beneficial in the long term to all states, even those which may be reluctant to make them for economic or other reasons. This concept reflects the "common heritage" approach to environmentalism, which theorizes that sovereignty "is obsolete and should be replaced by a concept of planetary citizenship."¹⁴⁰ While it is unlikely that this approach will be embraced wholeheartedly, there is hope that a balance between sovereignty and sustainability will be achieved. The question of how to approach nuclear regulation in a region such as the former Soviet Union is only one example of the array of problems facing the international community in resolving these issues.

Clearly, the time is ripe for international environmental law to have an increased role in the former Soviet Union. A coordinating

¹³⁸ *Ibid.* at 504.

¹³⁹ *Rio Declaration on Environment and Development*, UN Doc. A/Conf. 151/Rev. 1 13 (1992).

¹⁴⁰ Birnie, *supra* note 110 at 104.

central authority which would oversee the allocation of resources, encourage the incorporation of minimum international standards into effective and enforceable national laws, and encourages multilateral cooperation would be an important step in the process of cleaning up the aftermath of the Soviet nuclear frenzy. It is to be hoped that an acceptable threshold of state sovereignty can be maintained while providing the young nations of the CIS with the aid which they desperately need. It is only in this way that the path to safety in the nuclear industry, and thus the road to global environmental sustainability, can be made clearer.