Thorium Power Ltd. News Update
August 29, 2008

Letter from the CEO

Dear Stockholders:

We are pleased to share this latest news update, which includes company news as well as industry-related developments.

Latest Company News

Last month, we achieved a number of important business, personnel and industry milestones. First, we entered into two new agreements for consulting and strategic advisory services. The agreements are consistent with, and a result of, the UAE policy published in April 2008, for the evaluation and potential implementation of peaceful nuclear energy. Under one agreement, Thorium Power will provide strategic advice for the structuring and launch of Emirates Nuclear Energy Corporation (ENEC), the vehicle of the Government of the Emirate of Abu Dhabi that will develop and oversee nuclear energy development. Pursuant to the other agreement, we will provide strategic advice for the development and launch of an independent nuclear regulatory agency in the UAE - Federal Authority for Nuclear Regulation (FANR). The new agreements provide for pre-payment of $10 million USD upon signing by the government of Abu Dhabi with an additional pre-payment of $7 million USD to be paid upon formation of ENEC and FANR.

Additional Company News and Latest Media Coverage

During August, we also announced the appointment of two industry veterans to our senior management team. Kevin Yessian will serve as Thorium Power's Vice President for Consulting Services while Linda Byus will be an Advisor on Investment Relations. The addition of Kevin and Linda will further strengthen our core competencies as we grow to meet new business opportunities and an accelerated technological development timetable.

The presidential race has captivated all of America and it has obviously propelled a number of key issues, including energy and national security, to the forefront. Susan Eisenhower, one of the members of our International Advisory Board, delivered a speech on the final day of the Democratic National Convention. Susan’s speech reached millions of viewers and cemented her important role as an American leader with a unique grasp of domestic and international issues.

Separately, Peter Charles, Thorium Power’s Director of Corporate Affairs and Investor Relations, was selected by the Nuclear Energy Institute to join its newly launched “Clean Energy America” program. The initiative is designed to inform and educate the general public about the various benefits of nuclear energy. As part of a select, twelve-person delegation of industry experts, Peter will play a key role in educating the public about the important and critical role that nuclear energy will play in meeting current/future energy needs.

On the media front, we note the recent coverage in *The National* (Abu Dhabi) and *World Nuclear News*. Both publications covered the latest consulting agreements and *The National* stated the following: "With the UAE's population growth prompting energy consumption to jump by about 10 per cent per year, the authorities are exploring the creation of a nuclear power programme. The novelty, however, is that reactors located here could well be fuelled by thorium instead of uranium." We were also pleased to see the latest coverage in two leading Indian publications – *Daily News & Analysis (DNA)* and *Businessworld*, India's leading business magazine. *DNA* noted that "India's huge thorium reserves — about 25% of the world's total — are expected to fuel its power industry long-term." *Businessworld*, meanwhile, concluded that "at an estimated $2.5 billion per 1,000 MW of electricity — the capacity that most new plants will provide — the nearly 30 new reactors India will commission over the next four decades could be windfall business for US companies such as GE Energy, Thorium Power and Westinghouse Electric."

In addition to our recent milestones, it is also important to note that we have grown rapidly over the last few months. To support our current expansion and accommodate our growing team of industry experts, we relocated to a new office on August 26th. Our new address is:

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Latest Industry News

We also witnessed a number of positive developments in the industry over the last month. As the latest indication of growing interest in peaceful nuclear energy in the Middle East and North Africa region, Jordan signed cooperation agreements with China and France to promote the peaceful use of nuclear energy. Meanwhile, the UAE held a symposium focusing on the development of peaceful nuclear power, which was ushered in with the introduction of a paper titled "UAE Efforts in Peaceful Nuclear Energy."

Separately, the US-India nuclear deal continues to move forward. Indian officials met with the Nuclear Suppliers Group in Vienna in order to resolve key amendments, and the two sides are set to meet again in September. Several US officials, including Amb. David Mulford, the US ambassador to India, have repeatedly reaffirmed the US government's commitment to concluding the deal. Amb. Mulford noted that "[US] will continue to work with our Indian partners to persuade the Nuclear Suppliers Group countries that such an exemption is in the international community's best interest." As noted by one publication, "the amendment of NSG guidelines would trigger a rush of cooperation agreements with leading nuclear energy states."

Very Truly Yours,
Seth Grae
Chief Executive Officer

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Company News

World Nuclear News – Key nuclear bodies in the works for UAE (08.04.08) – The article comments on the recent consulting and strategic advisory agreements, noting Thorium Power's key role in the structuring, development and launch of the Emirates Nuclear Energy Corporation (ENEC) and the Federal Authority for Nuclear Regulation (FANR), the UAE's independent nuclear regulatory agency.

Daily News & Analysis – India can become one of the biggest in nuclear energy (08.09.08) – The extensive Q&A with Seth Grae focuses on business prospects in India and Thorium Power's potential role in the market. The article notes that "India's huge thorium reserves — about 25% of the world's total — are expected to fuel its power industry long-term."

Businessworld – Power Play: Nuclear Energy (08.01.08) – In an extensive analysis of India's nuclear market, India's largest business weekly notes that "the nearly 30 new reactors India will commission over the next four decades could be windfall business for US companies such as GE Energy, Thorium Power and Westinghouse Electric" and adds that "India also needs advanced US technology to best use thorium, a silvery metal that has been considered an alternative nuclear fuel to scarce and expensive uranium."

The National (Abu Dhabi) – When the old is new (08.20.08) – The local newspaper comments on the prospects for nuclear power in the UAE, noting the following: "With the UAE's population growth prompting energy consumption to jump by about 10 per cent per year, the authorities are exploring the creation of a nuclear power programme. The novelty, however, is that reactors located here could well be fuelled by thorium instead of uranium."

Latest Industry News

World Nuclear News – India trade talks set for second round (08.26.08) – The industry trade journal reports on the US-India nuclear agreement, and notes the latest talks with the Nuclear Suppliers Group in Vienna, Austria. The group has scheduled a second meeting in September to review and resolve key amendments.

The National (Abu Dhabi) – UAE nuclear power 'only for peaceful means' (08.24.08) – The local newspaper reports on a recent symposium at the Abu Dhabi-based Centre of Information Affairs, which focused on the development of peaceful nuclear power. A paper ("UAE Efforts in Peaceful Nuclear Energy") analyzing the UAE's general policy on the evaluation and potential development of peaceful nuclear energy was presented at the opening session.

Hindustan Times – U.S. Affirms It Will Seal Deal With India (08.26.08) – The newspaper reports that "US Ambassador David Mulford has reaffirmed his government's commitment to working with India to rapidly complete the remaining steps to conclude

the civil nuclear deal." The Ambassador notes that the "[US] will continue to work with our Indian partners to persuade the Nuclear Suppliers Group countries that such an exemption is in the international community's best interest."

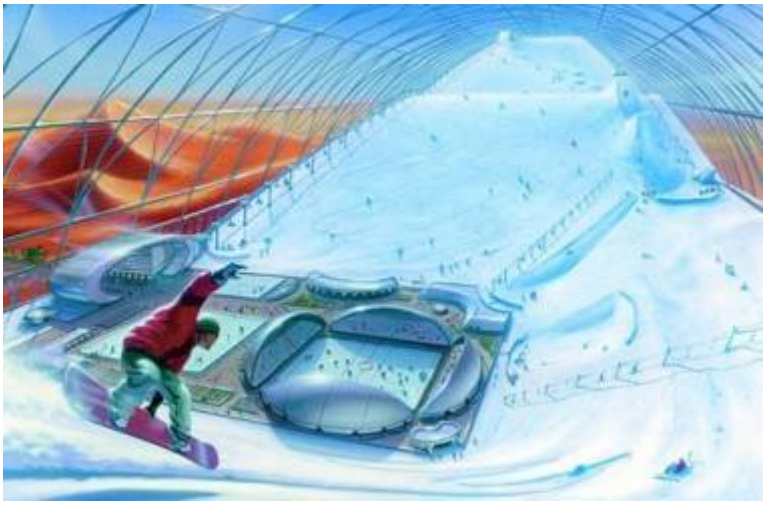
Statesman Journal – U.S. would benefit from nuclear power (08.21.08) – The editorial comments on the US-Russia "megatons to megawatts" accord, and calls for the "next president and Congress need to work in tandem to extend the accord to 2020 at least, so that the elimination of bomb-grade materials can continue. Beyond its value for arms control, the agreement increases the supply of uranium for U.S. nuclear plants, thereby reducing the cost of nuclear-generated electricity and thus providing a valuable weapon in the battle against global warming."

World Nuclear News – Jordan and China sign nuclear agreement (08.20.08) – As another indication of the positive, pro-nuclear developments in the Gulf region, the trade journal notes that Jordan and China have "signed a memorandum of understanding on cooperation in the peaceful use of nuclear energy, particularly electricity generation and water desalination."

New York Times – France Reaffirms Its Faith in Future of Nuclear Power (08.17.08) – The national newspaper extensively comments on France's traditional and ongoing commitment to nuclear power, noting that "nuclear power provides 77 percent of France's electricity, according to the government, and relatively few public doubts are expressed in a country with little coal, oil or natural gas."

Xinhua/Dow Jones – China To Build More Nuclear Power Plants Than Planned (08.15.08) – Dow Jones reports on China's ambitious growth plans for its nuclear industry, and notes that China "aims to let nuclear power capacity account for more than 5% of the country's total power capacity by 2020, an increase from the originally planned 4%." The country is building nuclear plants in coastal and inland areas.

Key nuclear bodies in the works for UAE
World Nuclear News
August 4, 2008



How will the UAE generate the power it needs for megaprojects like the forthcoming Dubailand Ski Dome?

Planners in the United Arab Emirates (UAE) have made agreements with Thorium Power toward setting up a national nuclear energy company and independent regulator.

The five-year deals, which come with a $17 million prepayment for the first six months' work, were announced by Thorium Power on 1 August. The US-based firm said it would provide strategic advice on the development and launch of an independent nuclear safety regulator, to be called the Federal Authority for Nuclear Regulation. More advice will be given on the structuring and launch of a company called Emirates Nuclear Energy Corporation (Enec), which will be a vehicle of the Emirate of Abu Dhabi.

Enec will take the role of a 'nuclear energy program implementation office' as recommended by the International Atomic Energy Agency (IAEA), which has been liaising with the UAE as it does with the many other countries interested in nuclear energy.

Thorium Power will receive $10 million of its prepayment when the deals are signed off by the government of Abu Dhabi, and another $7 million when the two new organisations are up and running. Further payments would come during the remainder of the five year period, Thorium Power told *WNN*.

These agreements come after Thorium Power helped the UAE develop its overall strategy for the introduction of nuclear energy. The company is best known for its efforts to license thorium-based light-water reactor fuel for wider use, but chief operating officer Erik Hallstrom said: "Our consulting business gives us the opportunity to generate revenue early in the nuclear renaissance while simultaneously pursuing longer-term upside from our technology licensing business."

Thorium Power's consultancy work helped the UAE to develop the white paper on nuclear power it published in April this year.

Predictions in the white paper showed electricity demand growing from around 15 GWe today to almost 41 GWe in 2020 - a growth rate of about 7% per year. The country plans to use nuclear energy to meet part of this demand, as well as to meet needs in industrial processes such as desalinating seawater. A partnership agreement already exists between nuclear technology provider Areva and the oil firms Total and Suez to build a power and desalination plant based on two 1600 MWe Areva EPR units in the UAE.

India can become one of the biggest in nuclear energy
By Uttara Choudury
DNA (Daily News & Analysis, India)
August 9, 2008

The cost of oil and concern about carbon emissions from coal burning are pushing India to pursue nuclear energy vigorously. It is likely to spend $100 billion expanding its power capacity over the next 20 years and the nuclear deal will crack open the market for US companies.

Costing $2.5 billion per 1,000 megawatt, the 30 new reactors India will commission could mean big contracts for US companies like GE Energy, Thorium Power and Westinghouse Electric. India is also keen to get its hands on US technology to best use thorium, a silvery metal considered an alternative nuclear fuel to costly uranium.

Due to years of nuclear isolation and limited uranium stocks, Indian scientists tapped the country's abundant thorium assets. India's huge thorium reserves — about 25% of the world's total — are expected to fuel its power industry long-term.

"The amount of nuclear power potentially that can be deployed in India could make it one of the largest nuclear energy markets in the world," said Seth Grae, president and CEO of Thorium Power, a pioneer in developing non-proliferative nuclear fuel based on thorium.

With 17 plants in operation, nuclear energy provides 3% of India's electricity. But by 2050, nuclear power is expected to supply 25% of the country's electricity.

Grae talked with Uttara Choudhury in New York about how his firm was looking to do business in India by offering advisory services and licensing thorium-based fuel technologies. It is also hoping to clinch deals with companies like Reliance Power, Tata Power and Larsen & Toubro who want to foray into nuclear power generation.

Does Thorium Power see India as a big market and a partner in developing thorium-based fuel technologies?

There is a strong interest in potentially working together once the 123 Agreement for civil nuclear energy is completed, which looks like it will be in the relatively near term.

The thorium available within India allows it to pursue a nuclear power programme without as much reliance on outside sources of fuel material. Some countries have a lot of uranium; some countries import all of the fuel material. India has the ability to use its own thorium and not rely on outside sources as much for its nuclear fuel. That is very important.

Leading scientists in the Bhabha Atomic Research Centre and other places where there is great expertise in thorium understand the benefits of using thorium in their reactors which helps in proliferation resistance, reducing waste and improving the efficiency of electricity generation. India can have a model programme by using thorium rather than doing what so many others have done.

At Thorium Power we have two main business lines — we are engaged in technology development using thorium fuels for reactors and we provide strategic advisory services. We have been in discussions in India along both these areas. There can be synergies not just in using our technology, but also some of our approaches in the advisory services. The bottom line is that India represents an important market for us.

Would Thorium's advisory service help Indian power companies draw up plans to build-out nuclear energy plants?

Yes, we are in some discussions in the private sector. I think India will have a great deal that will be done in the private sector. The private sector ultimately is the great economic engine for investment, R&D and for deploying plants. I think part of what we offer there is that we are not so strongly linked to one reactor vendor. Our advice is not subject to the conflict of interest you might see with some other companies that are so linked to one of the major companies and its technology. Our thorium-based technology can be adapted towards any of the light water reactors.

I do think there will be private-public partnerships. Thorium Power very likely will have significant activities with the private sector.

Are you talking to Indian companies?

Yes.

Can you name them?

No.

Are you concerned that a delay in the deal's passage could mean US companies might not be at the front of the line for contracts for the new Indian nuclear plants?

That's always a possibility but I don't think that is a likely scenario. First of all, I don't think they have nearly the thorium technology approaches that we have or history of dealing with some people in India on thorium issues.

Also, I know they don't have our technology which is unique in how well it works with

India's desire to use thorium in existing light water reactors and new ones. Finally, as I understand it the members of the Nuclear Suppliers Group are sticking together on this. I don't think one country will supply to India if others can't yet.

Even if the deal goes through, India still has to sign the Convention on Supplementary Compensation Treaty which supports a global pool of money to pay victims of nuclear disasters. Since India's not a party to this treaty, are US firms worried about civil liabilities?

I don't think there would be any real liability issue on the nuclear fuel technology. It is something we would need to look at for liability, but at this point, we don't see anything that would stop us from working in India if the 123 Agreement is approved.

Have your scientists built a new fuel element that can be retro-fitted or placed into conventional uranium-run reactors?

Our fuel is a replacement fuel, not a change to the reactor. It would be like going from one type of gasoline for a car to an unleaded gasoline without any changes to the car. We are the leading developer of non-proliferative nuclear fuel technology for existing light water reactors and new reactors that will be built in the future, we believe in India.

Does India have the potential to be one of the biggest markets?

Yes. The amount of nuclear power potentially that can be deployed in India could be enough to make it one of the largest nuclear markets in the world over the next few decades.

Already there are reactors under construction in India. And, there are new reactors being planned. There is a great deal of activity leading up to this 123 Agreement being signed. I expect things to happen rapidly once the agreement comes through.

What savings can plants expect from using thorium-linked fuel technology?

Depending on the reactor, fuel composition, and whether the reactor operator or government pays for spent fuel handling costs, this savings could range between 5% and 20% cheaper fuel costs for the same amount of electricity generated versus what the fuel costs would be using standard uranium fuel.

POWER PLAY: Nuclear Energy
By Srikant Srinivas and Uttara Choudury in New York
Businessworld
August 1, 2008

For most people, the nuclear energy issue is much like the story of the six blind men and the elephant: different pieces, but no coherent overall picture. For some, it's like the sides of the pachyderm in John Godfrey Saxe's poem: a wall. For others, it's like the trunk, snake-like and hard to get a handle on. For yet others, it's like the elephant's tail, a rope that we are binding ourselves with.

Nuclear energy is politically sensitive and divisive, and many people believe that the US-India deal compromises our sovereignty and makes us a vassal of the US. Neither do we want foreigners dictating our national security. Then there are health, safety and environmental concerns, which are well-documented and widely known.

But nuclear energy is important to sustain our growth momentum as well. The recent oil price hikes and the near-crisis that high energy prices caused in several countries have re-opened the nuclear debate. Climate change concerns have also forced policy makers and politicians globally to reconsider the option of nuclear energy. Simply put, we may be on the cusp of a nuclear renaissance.

And for the first time in decades, the creation of a civilian nuclear energy industry in India has become a real possibility once the US-India 1-2-3 agreement is signed. It's an idea that excites global companies that design, construct and manage nuclear energy plants and complexes: GE, Areva and Westinghouse Electric, in addition to Mitsubishi Heavy Industries and Toshiba of Japan.

For three years now, executives from the US nuclear power industry have been coming to New Delhi, meeting with Indian government officials, and lobbying the US Congress for the passage of the deal. Ron Somers, president of the US-India Business Council in Washington, says US industry would be "front and centre" in advocating the deal when it comes up for ratification before the US Congress.

"We are encouraged by recent statements made by Senate Foreign Relations Committee Chairman, Senator Joe Biden, who says he will find time to press for ratification of the 1-2-3 Agreement so long as India is able to complete its steps," says Somers. Also standing on the sidelines — at least for the present — are a host of Indian companies such as Reliance Power, Tata Power and Larsen & Toubro, who want a piece of the action.

The Nuclear Renaissance
India is likely to spend more than $100 billion expanding its national power capacity over the next 20 years and US firms are expecting the nuclear deal to pave the way for big contracts. This message is unlikely to be lost on the US Congress. At an estimated $2.5 billion per 1,000 MW of electricity — the capacity that most new plants will provide — the nearly 30 new reactors India will commission over the next four decades could be windfall business for US companies such as GE Energy, Thorium Power and Westinghouse Electric.

With 17 plants in operation, India already has a flourishing and largely indigenous nuclear power programme. But at present, nuclear energy provides only about 2.5 per cent of India's electricity; the goal is for nuclear power to supply 25 per cent of electricity by 2050.

The target since 2004 has been to provide 20,000 MW of nuclear power by 2020; in 2007 Prime Minister Manmohan Singh said this target was "modest" and capable of being "doubled with the opening up of international cooperation". However, it is evident that on the basis of only indigenous fuel supply, the 20,000 MW target is not attainable, or at least not sustainable without uranium imports.

The Department of Atomic Energy (DAE) says that the large energy gap projected for 2050 — an estimated 40,000 MW of capacity that has to be added — can be bridged if 40 one-GW (gigawatt, or 1,000 MW) pressured water reactors (PWRs) plus uranium to fuel them are imported during 2012-20.

Because India is not a signatory to the nuclear Non-Proliferation Treaty (NPT), due to its weapons programme, it is largely excluded from access to nuclear plants or materials, which has hampered development of a civilian nuclear energy industry. That is what the US-India nuclear agreement is intended to address: assured fuel supplies for its operating plants and access to new technologies.

The Thorium Advantage

India also needs advanced US technology to best use thorium, a silvery metal that has been considered an alternative nuclear fuel to scarce and expensive uranium. Due to years of nuclear isolation and lack of domestic uranium, Indian scientists have worked hard at tapping the country's abundant thorium reserves.

"The thorium available in India allows it to pursue a nuclear power programme without much reliance on outside sources of fuel material," points out Seth Grae, president and CEO of Thorium Power, a firm specialising in developing and testing proliferation-proof nuclear fuel based on thorium. "Some countries have a lot of uranium; others import all of the fuel material. India has the ability to use its own thorium. I think that is very important."

It's true that so far, India's nuclear power programme has gotten along largely without fuel or technological assistance from other countries. But until the mid-1990s, Indian-made power reactors had some of the world's lowest capacity factors, reflecting the technical difficulties of the country's isolation.

In the US, between 1990 and 2007, productivity gains enabled improvements in the performance of civilian nuclear facilities by an amount equivalent to 27 new 1,000-MW power plants. Based on that success, the Nuclear Regulatory Commission has, since 2000, authorised 67 power up-rates — increases in power capacity and output — that will yield a cumulative capacity increase of almost 2,965 MW, equivalent to about three new 1,000-MW plants. For India, access to those technological advances would improve efficiency dramatically.

Global reserves of thorium — India, Australia, Norway and the US possess the largest

reserves — could meet the world's energy needs for centuries. Now, consider what it means for India to be able to do business with the cliquish club of nuclear technology suppliers.

"There is a strong interest in potentially working together once the 1-2-3 Agreement for civil nuclear co-operation is completed, which looks like it will be in the relatively near term," says Grae.

The Economics Of Nuclear Power

Despite the advantages that the nuclear deal can bring, opponents to it point out that the economics of nuclear power make it very expensive; additionally, they say (see 'N-Energy Is Not Clean' on page 44) the adverse environmental fallout is considerable, from mining, extraction and processing, to storage and disposal of nuclear waste.

The four factors that we have to take into consideration in assessing the economics of nuclear power are construction, financing, operating and waste management costs. According to the World Nuclear Association — an association of companies that trade in nuclear energy-related materials — construction costs per kilowatt hour have fallen considerably due to standardised design, shorter construction times and more efficient generating technologies.

Financing costs for new nuclear plants, a critical component of nuclear economics, are expected to fall as new approaches are developed and tested, says the WNA. Operating costs of nuclear power plants have fallen steadily over the past 20 years as capacity factors have increased, squeezing far more output from the same generating capacity. Waste management costs, which are included in the operational costs of nuclear plants, represent a tiny fraction of the lifetime costs of a reactor's operation.

Energy analysts use the levelised cost of electricity (LCOE) — the price that covers both the operating costs and the annualised capital costs — as a benchmark for economic viability. Several studies have been conducted in the past five years — including by the University of Chicago, the International Energy Agency (IEA) and Organisation for Economic Cooperation and Development (OECD), the Massachusetts Institute of Technology and the Royal Academy of Engineering — on the costs of setting up new nuclear energy facilities.

The balance between capital costs and fuel costs depends upon the generating technology. For combined cycle gas turbine (CCGT, that uses naphtha), the capital costs account for about 20 per cent of the investment. For a new nuclear plant, that number (including accrued interest) is nearly 60 per cent. With CCGT plants, fuel costs are almost 75 per cent of the LCOE, but nuclear fuel account for just about 25 per cent. Recent events — the volatility in fossil fuel prices that some analysts believe will continue for some years to come — underscore the viability of nuclear energy as an alternative.

The Long And Winding Road

But the road to achieving energy security for India is a difficult one (see timeline below). In between, there are several uncertainties. "The US-India deal goes against the grain for those members — including New Zealand and the Netherlands — for whom non-proliferation is an important issue, and they have strongly held views on it," says T.P.

Sreenivasan, former Indian ambassador to the Vienna-based International Atomic Energy Agency. But perhaps not enough to test the will of the US.

What India is looking for, Sreenivasan adds, is a statement that reads something like this: “The NSG guidelines will not apply to India.” But what they might get is something more qualified and that may ask for some assurances on verification of use of nuclear fuel, nuclear testing, reprocessing and similar issues.

The US Congress took 13 years to approve a 1-2-3 Agreement with China after President Ronald Reagan submitted it to the US Congress in 1985. Nobody believes that it will take that long for India. Is there time for the election-year Congress to approve the nuclear deal before President Bush leaves the White House?

Timeline: The Crucial Stages of the Process

9 JULY: India submitted a draft nuclear safeguards accord to the IAEA

1 AUGUST: The IAEA board could meet on the issue of rules for India.

2 AUGUST: If the IAEA gives India a thumbs-up on 1 August, then the US will ask the NSG for a consultative meeting to move to the next stage.

11 AUGUST: The first NSG consultative meeting at which the US will propose that the NSG give India a waiver from the NSG guideline.

SEPTEMBER FIRST WEEK: India may obtain a waiver for the nuclear deal from the NSG at a full plenary meeting.

SEPTEMBER AND PERHAPS TWO WEEKS IN OCTOBER: US Congress will be in session to consider the nuclear deal. India is yet to sign the Convention on Supplementary Compensation (CSC), an international treaty that created a fund to pay victims of nuclear disasters. If India does not sign it, American-built reactors would have to shoulder their own civil liabilities — a prohibitive cost.

THE FINAL LAP: After US Congressional approval, the 1-2-3 Agreement will be signed. American companies can then enter into specific deals. It could take two years from then for the first fuel supplies to arrive at our nuclear plants.

The US Congress is scheduled to be out of session in September and it already has a lengthy list of bills to consider, but the administration is trying to build enough momentum for the Indian nuclear deal on Capitol Hill to get it on the agenda. “We’re going to be communicating to the Hill how important this measure is for the US, and how important we believe this partnership will be for India,” says State Department spokesman Gonzalo Gallegos.

“It is going to be tight, if only because we are in the second half of an election year,” says Ashley J. Tellis, a senior associate at the Carnegie Endowment for International Peace, who was intimately involved in negotiating the deal as an adviser to former US Under secretary of State Nicholas Burns. But with a “bit of luck”, he doesn’t think it is impossible. All the players involved want to see this done quickly, he says.

“Practically speaking, it will be very difficult for the US Congress to take up the nuclear issue again before the end of the year,” says Jim McDermott, a senior Democrat leader who is the co-chair of the Congressional Caucus on India and Indian Americans.

Who Wins, Who Loses, Who Gets Away?

But how important is it for the US? Any delay in the India-US deal’s passage could mean US companies might not be at the front of the line for contracts for the new Indian nuclear reactors. Also, as a leading US business magazine, points out, India has yet to sign the Convention on Supplementary Compensation (CSC).

Power Reactors Under Construction

Reactor	Type	MWe Net Each	Project Control	Commercial Operation	Safeguards Status
Kaiga 4	PHWR	202	NPCIL	End of 2008	
Rawatbhata 5 & 6	PHWR	202	NPCIL	End of 2008, 3/09	By 2008 under new agreement
Kudankulam 1 & 2	PWR	950 (VVER)	NPCIL	9/2009, 12/09	Item-specific
Kalpakkam PFBR	FBR	470	Bhavini	2010	Unlikely
Total (6)		2,976 MWe			

Power Reactors Planned and Proposed

Reactor	Type	MWe net, Each	Project Control	Start Operation
Kakrapar 3 & 4	PHWR	640	NPCIL	2012
Rawatbhata 7 & 8	PHWR	640	NPCIL	2012
Kudankulam 3 & 4	PWR-VVER	1,000	NPCIL	ND
Jaitapur 1 & 2	PWR	1,000	NPCIL	ND
ND	PWR x 2	1,000	NTPC	2014
ND	PHWR x 4	640	NPCIL	ND
ND	FBR x 4	470	Bhavini	2020
ND	AHWR	300	ND	2020

ND: Not disclosed

Source: *BW* research

The CSC treaty is a global pool to pay victims of nuclear disasters; unless India signs it, any American-built reactors would have to shoulder their own civil liabilities.

“American companies are concerned that India has not ratified international nuclear liability agreements,” says Daryl Kimball of the Arms Control Association. “They are concerned they will be liable for accidents.” But companies from other countries, especially France, Russia and Japan, are not likely to be as affected.

Areva has exploratory agreements in place that almost assure it of a site in western India, and Russian companies are planning to help build a nuclear reactor in Kudankulam in Tamil Nadu once India gets a “clean and unconditional exemption” from the NSG guidelines.

But R.B. Grover, director at India’s DAE and India’s chief negotiator for the nuclear deal, recently suggested that there was no cause for worry. “Irrespective of any understanding or quid pro quo, the demand for electricity in India is so large, we can accommodate all countries,” he told the US media.

When the old is the new
The National (Abu Dhabi)
August 20, 2008

Sir Ernest Rutherford, winner of the 1908 Nobel Prize for chemistry, is considered the father of nuclear physics. Science Photo Library

With the UAE's population growth prompting energy consumption to jump by about 10 per cent per year, the authorities are exploring the creation of a nuclear power programme. The novelty, however, is that reactors located here could well be fuelled by thorium instead of uranium.

Thorium, the radioactive element first named for the Scandinavian site of its discovery, and experimented with by Ernest Rutherford, one of the founding lights of nuclear physics, has become an increasingly attractive energy option.

Rutherford and fellow physicist Frederick Soddy showed how thorium decayed at a fixed rate over time into a series of other elements. This observation led to the identification of half-life as one of the outcomes of alpha particle experiments that led to their disintegration theory of radioactivity.

Earlier this year the UAE Government signed two consulting agreements with Thorium Power, a US company, to explore the possibilities of creating a thorium-based nuclear energy programme.

India and Norway, which both have significant natural reserves of thorium, are among numerous other countries looking into the possibility of building thorium-based reactors.

As reserves of uranium decline – they are expected be depleted within the next 70 years – and as prices of the element increase, other countries could jump on the bandwagon, particularly since worldwide energy consumption is predicted to double by 2050.

Thorium, whose chemical symbol is Th, has several advantages over uranium, among them the fact that it is five times more abundant on the planet.

In pure form thorium is a silvery-white metal, but when bombarded with neutrons, it converts into an unstable form of uranium than can be used as nuclear fuel.

Dr Frodo Klaassen, a nuclear power researcher at the Nuclear Research and Consultancy Group (NRG) in The Netherlands, says thorium is one of a very limited number of alternatives available to uranium. Few elements, he says, "behave" properly in a reactor and can withstand temperatures as high as 1,500C while generating nuclear fission products.

"There are a number of aspects linked to the behaviour of fuels; that's why it's difficult to find alternatives," he explains.

Thorium does behave well, Dr Klaassen says, elaborating that this has been demonstrated at a thorium test reactor operated by NRG at Pletten in North Holland and at a nuclear power plant in Obrigheim in Germany. At each location, reactors fuelled by

thorium were operational between 2001 and 2005. A reactor contains rods that contain the nuclear fuel in pellet form. If something goes wrong – not impossible in such a hot and highly pressurised environment – the fuel rods could rupture, leaving nuclear material to come into contact with the cooling water that surrounds the rods.

“The most important thing is that there has to be compatibility between your fuel and the coolant water. For both uranium and thorium, this is good. Thorium is neither better nor worse,” Dr Klaassen says.

“What’s important is that there’s no melting of your fuel. Some of the biggest accidents happen when the core melts.”

Fortunately, with thorium such melting is highly unlikely as thorium dioxide has a melting point of 3,300C – the highest for any oxide.

“Also, when the temperature rises, you want your nuclear chain reaction to go down and to produce less energy. This so-called ‘Doppler’ feedback mechanism is very important and it is there for thorium and uranium,” says Dr Klaaffen.

Another advantage to thorium is that it produces waste that is less problematic than other fuels.

It takes 130,000 years for the waste from a uranium plant to return to the radioactivity level of the original raw material, while for a thorium power plant, because less plutonium is generated, the time is reduced to several thousand years.

There are disadvantages to thorium, however, most of them stemming from the fact that it is not currently used for any commercial power generation.

In contrast to the case with using uranium in reactors, the technology is at an earlier stage and therefore it would take “decades” to have a reactor fully up and running.

Setting up a uranium nuclear energy generating process involves mining the raw material, enrichment, fabrication of the nuclear fuel, power generation in the reactor and reprocessing of spent fuel. But for thorium creating such a cycle is a long way off.

For the time being, however, organisations creating a nuclear power plant can buy uranium fuel rods from commercial companies based in countries such as France or Japan.

Although enrichment is not needed with thorium (neutron bombardment to create the fissile isotope is necessary, however), thorium fuel rods are not available commercially. According to Dr Klaassen, a fuel fabrication plant would have to be built specially to supply a reactor.

The reactors are the same whether fuelled by thorium or uranium, so the design and construction of a facility should not pose any serious obstacles.

However, reprocessing the spent material differs from reprocessing that from uranium reactors, and the procedures are not well developed on an industrial scale.

“If you want to reuse the uranium that you’ve used in the thorium cycle, you have to take it out and do a number of recycling steps. There is some technological development to be done,” said Dr Klaaffen.

“At the moment we’re not mining and fabricating thorium fuels. That’s something we need for sure. For a more advanced cycle, you need reprocessing in place as well.”

Given these uncertainties, Dr Klaassen is cautious about making predictions regarding the future of thorium-powered nuclear power stations.

Thorium nuclear energy is only something that governments taking the long-term view will consider, he says, because there are so many expensive hurdles to overcome.

“Using thorium is not going to be a commercial decision,” Dr Klaassen says. “It will be a strategic decision by a country to secure their energy supply for when uranium becomes less abundant or very expensive. It’s a decision for the future.”

Although thorium is certainly not the easiest option, as uranium prices continue to increase, the balance could swing in its favour.

“The higher the price of uranium, the more interesting thorium will become,” Dr Klaassen says. “From a technical point of view, it wouldn’t be the holy grail of nuclear energy, but technically and economically it would be a very nice system.

“We have to fight climate change and create energy in an environmentally friendly way and thorium is opening new resources for energy because it’s abundant and it produces less-dangerous nuclear waste.”

India trade talks set for second round

World Nuclear News
August 26, 2008

Last week's talks at the Nuclear Suppliers Group (NSG) were adjourned leaving a second meeting in early September key to the Indian nuclear trade initiative.

The 'extraordinary plenary meeting' took place under German chairmanship in Vienna, Austria on 21 and 22 August. Although NSG proceedings are carried out in confidence, it is understood that a number of nations including Austria, Denmark, Ireland, Finland, New Zealand, Norway and Sweden raised amendments to the proposals tabled by the USA. Leading nuclear countries including France, Russia and the UK are known to be strong supporters of the original proposal.

For their part, Indian leaders said that they want no extra requirements placed on them, having already agreed a specific safeguards agreement with the International Atomic Energy Agency (IAEA). US negotiators said they remained confident in their proposals and that they expected objectors' concerns to be eliminated at a 3-5 September meeting.

The 45 members of the NSG restrict trade in potentially sensitive nuclear technologies to other nations that have signed the Nuclear non-Proliferation Treaty (NPT). In practice this means only India, Israel, Pakistan and North Korea are excluded from trade in uranium, nuclear fuel and nuclear reactor technologies.

The creation of the NSG was a reaction to India's 1974 test of an atomic weapon made with the help of a Canadian reactor which had been sold for the peaceful generation of electricity only. Together with the NPT and the work of the IAEA, the NSG guidelines have ensured a clear divide between civil and military uses of nuclear energy ever since.

The amendment of NSG guidelines would trigger a rush of cooperation agreements with leading nuclear energy states. Those could be followed by commercial contracts in nuclear power with Indian firms entering the global market as both buyers and sellers. This would help India rapidly advance its existing self sufficient nuclear science, skills and technology base as well as to gain access to much more secure supplies of uranium for its power reactor fleet.

UAE nuclear power 'only for peaceful means'
The Nation (UAE)
August 24, 200 8

Abu Dhabi: The UAE's efforts to develop peaceful nuclear energy were at the focus of a symposium organised on Sunday by the Abu Dhabi-based Centre of Information Affairs where diplomats and experts engaged in open discussions.

A paper analysing the UAE's general policy on the evaluation and potential development of peaceful nuclear energy was presented by the centre at the opening session called UAE Efforts in Peaceful Nuclear Energy.

According to the paper, the UAE has always reiterated its call for the non-proliferation of nuclear weapons, affirming that the use of nuclear energy should be confined to peaceful purposes, and in accordance with the highest standards set by the International Atomic Energy Agency (IAEA).

President His Highness Shaikh Khalifa Bin Zayed Al Nahyan, the paper stressed, has already clarified this stance by saying: "Talking about peace in this vital area of the world requires intensified efforts to remove all causes of tension; therefore, establishing an effective balance of power in the region will be achieved only if all Middle East countries undertake to ban the use of nuclear and other mass destruction weapons."

Guiding principles

The UAE will follow a number of guiding principles, including complete operational transparency; the highest standards of non-proliferation, safety and security; and close coordination with the IAEA, said the paper.

The GCC Secretary-general, Abdurrahman Al Atiyyah, praised the UAE's general policy document, describing it as "an important move that agrees with the GCC countries' efforts aimed at developing a peaceful nuclear energy programme, with the commitment to full transparency and the highest standards of non-proliferation and of safety and security," as quoted by the paper.

The paper also pointed to the approval of this policy by the US Secretary of State, Condoleezza Rice; the US Assistant Secretary of State for Near Eastern Affairs, David Welch; the UK Minister of State for Trade and Investment, Lord Digby Jones of Birmingham; Chinese Foreign Ministry's Spokesperson Liu Jianchao; and Finland's Undersecretary of State for Political Affairs, Markus Lyra.

Vincent Floreani, Deputy Head of Mission at the French Embassy in Abu Dhabi, presented a paper called, France's Contribution to the Peaceful Uses of Nuclear Energy' in which he said that the cooperation agreement to develop the peaceful uses of nuclear energy, which was signed in Abu Dhabi on January 15, 2008, during the visit of President Sarkozy to Abu Dhabi, has set out the institutional framework for cooperation on nuclear energy between France and the Emirates.

"From a French perspective, the requests of countries wishing to benefit from this clean low-cost energy are legitimate," the French diplomat said, noting that, "in the face of the

global challenges such as global warming and raising the cost of oil, we cannot content ourselves with seeing only to our own French needs."

He quoted President Nicolas Sarkozy as saying "nuclear energy can be a tool for peace. It can be a tool for development."

He also stressed that France is actively supporting the establishment of a multilateral supply mechanism, which could take the form of a fuel bank.

This bank will guarantee everyone continuous access to uranium supplies for their reactors without the need to develop autonomous enrichment capabilities.

Pro-active

Dr Andreas Sizmann, a German expert in science and technology, presented a paper in which he said that the UAE is shaping its energy future pro-actively with various alternative energy initiatives and programmes.

The UAE's Masdar Initiative is a highly visible and valuable contribution to create worthwhile perspectives and to break new ground for renewable energy systems, he said.

Matti Lassila, Ambassador of Finland to the country, said the UAE is taking its part in the proper management of our globe.

"It is certain that the country will take its global responsibilities seriously and environmental issues will be high amongst its priorities," he said.

U.S. Affirms It Will Seal Deal With India
Hindustan Times
August 26, 2008

US Ambassador David Mulford has reaffirmed his government's commitment to working with India to rapidly complete the remaining steps to conclude the civil nuclear deal.

"The US and India stand shoulder-to-shoulder in their desire for a clean exception and we will continue to work with our Indian partners to persuade the Nuclear Suppliers Group countries that such an exemption is in the international community's best interest," said Mulford.

"Ahead of the scheduled NSG plenary on September 4, the US and India will continue the vigorous joint advocacy for the initiative at the highest levels of NSG governments," the ambassador added.

Interestingly, Mulford used the word "clean" and not unconditional for the waiver, something India has been insisting upon. Clearly, there are gaps in perception between India and the US as they try to take the deal through the last mile.

His comments came on a day when US Assistant Secretary of State Richard Boucher met officials in the External Affairs ministry. They were to discuss the situation after last week's NSG meeting in Vienna failed to produce a consensus on allowing India to source nuclear supplies from abroad.

Boucher refused to answer questions from the media after his meetings in the ministry. But last week in Mumbai, he had said there would have to be changes in the draft that came up for discussion in Vienna.

In the July 2005 Indo-US agreement, Washington was to adjust US laws and policies and "work with friends and allies to adjust international regimes to enable full civil nuclear energy cooperation and trade with India". The NSG, clearly, is a critical part of the "international regimes" that govern civil nuclear cooperation.

India, on its part, has completed its commitments under the deal, including the conclusion of a fresh safeguards pact with the International Atomic Energy Agency (IAEA). Several small countries, many of them opposed to nuclear energy, have created problems for India's waiver at the NSG**.**

U.S. would benefit from nuclear power
Statesman Journal
By John C. Ringle
August 21, 2008

A remarkable program aimed at reducing the ingredients of nuclear weapons has brought one old argument to an end:

Is a nuclear power plant useful in preventing highly enriched uranium and plutonium from falling into the wrong hands? It is.

For years, anti-nuclear groups have been telling the world that halting the use of nuclear power would alleviate the danger of weapons proliferation. All that talk was blown away by the news that 327 metric tons of bomb-grade uranium from Russian nuclear warheads has been blended down into low-enriched uranium, and then used as fuel in U.S. nuclear power plants to produce electricity for American homes and businesses.

Everyone involved in nuclear power can see that reality clearly. At least half of the fuel used in U.S. nuclear plants comes from Russian nuclear warheads that were once targeted at U.S. cities. This achievement was made possible in a 1993 agreement between the United States and Russia to help prevent the spread of weapons of mass destruction.

Known now as the "megatons to megawatts" accord, it has led to the destruction of more than 13,000 Russian nuclear warheads. Russia gets dollars in return for the uranium, and it also receives U.S. technical assistance in converting surplus plutonium into mixed-oxide fuel that's being burned up in Russia's advanced "fast" reactors. The accord calls for the elimination of 20,000 Russian warheads by 2013. Its objective is to prevent missile materials from reaching rogue countries and terrorist groups.

The next president and Congress need to work in tandem to extend the accord to 2020 at least, so that the elimination of bomb-grade materials can continue. Beyond its value for arms control, the agreement increases the supply of uranium for U.S. nuclear plants, thereby reducing the cost of nuclear-generated electricity and thus providing a valuable weapon in the battle against global warming.

In years ahead, the benefits from nuclear power would be considerably greater if the United States resumes the reprocessing of spent fuel. Disposing of this nuclear material — which contains valuable uranium and plutonium — as if it were nuclear waste is nonsensical.

With reprocessing, the uranium and plutonium are removed from spent fuel and converted into uranium fuel or mixed-oxide fuel for use at nuclear power plants to produce more electricity. If we can make use of nuclear fuel made from Russian warheads, why not do the same with the 55,000 metric tons of spent fuel now stored at nuclear plant sites throughout the United States?

France, Great Britain, Japan and Russia derive great benefit from reprocessing. We should be doing the same.

One of the key objectives of the Department of Energy's proposed Global Nuclear Energy Partnership is establishing a new reprocessing plant in the United States. With reprocessing, each metric ton of spent fuel would yield as much energy as 100,000 barrels of oil.

The United States has made the most of an extraordinary opportunity with the megatons to megawatts program. We need to summon the same common sense again by recycling spent fuel to generate electricity.

John C. Ringle of Corvallis is professor emeritus of nuclear engineering at Oregon State University. He can be reached at ringlejc@ne.orst.edu.

Jordan and China sign nuclear agreement
August 20, 2008
World Nuclear News

Jordan and China have signed a memorandum of understanding on cooperation in the peaceful use of nuclear energy, particularly electricity generation and water desalination.

The agreement was signed by Khaled Touqan, president of Jordan's Atomic Energy Commission, and Gong Xiao Sheng, China's ambassador in Amman.

The agreement paves the way for cooperation between the two countries in the fields of basic and applied research and development of peaceful uses of nuclear energy; the design, construction and operation of nuclear power plants; as well as the exploration and processing of uranium.

Touqan told the official Jordanian News Agency (Petra) that the agreement aims to establish a legal and political framework for cooperation between the two countries. He noted that that the agreement focused on the prospect of cooperation in training. Jordan will this year send five postgraduate students to undertake masters and doctorate studies in China in the field of nuclear energy upon scholarships provided by the Chinese government.

In addition, Touqan said that both China and Jordan are preparing to begin studies for the prospecting and mining of uranium in several regions in Jordan. The country has low-cost uranium resources of 140,000 tU plus another 59,000 tU in phosphate deposits. A feasibility study on recovering uranium as a by-product of phosphate production is also under way.

The Chinese ambassador said that the cooperation agreement "is the beginning of cooperation in the field of nuclear energy and other projects serving the interests of the two countries."

Jordan has signed nuclear cooperation agreements with the USA, France and UK, in respect to both power and desalination, and is seeking help from the International Atomic Energy Agency (IAEA). Jordan joined the Global Nuclear Energy Partnership (GNEP) in 2007.

The country currently imports about 95% of its energy needs. Jordan also has a 'water deficit' of about 500 million cubic metres per year. The energy minister has said that the country expects to have a nuclear power plant operating by 2015, for electricity and desalination. Jordan's Committee for Nuclear Strategy has set out a program for nuclear power to provide 30% of electricity by 2030, and to provide for exports.

France Reaffirms Its Faith in Future of Nuclear Power
By Steven Erlanger
New York Times
August 17, 2008

FLAMANVILLE, France — It looks like an ordinary building site, but for the two massive, rounded concrete shells looming above the ocean, like dusty mushrooms.

Here on the Normandy coast, France is building its newest nuclear reactor, the first in 10 years, costing $5.1 billion. But already, President Nicolas Sarkozy has announced that France will build another like it.

Flamanville is a vivid example of the French choice for nuclear power, made in the late 1950s by Charles de Gaulle, intensified during the oil shocks of the 1970s and maintained despite the nightmarish nuclear accidents of Three Mile Island and Chernobyl.

Nuclear power provides 77 percent of France's electricity, according to the government, and relatively few public doubts are expressed in a country with little coal, oil or natural gas.

With the wildly fluctuating cost of oil, anxiety over global warming from burning fossil fuels and new concerns about the impact of biofuels on the price of food for the poor, nuclear energy is getting a second look in countries like the United States and Britain. Even Germany, committed to phasing out nuclear power by 2021, is debating whether to change its mind.

France is way ahead. Électricité de France, or EDF, is in talks to buy British Energy, for about $24 billion, to renovate Britain's nuclear plants and build new ones. The French have already contracted to build a third-generation European Pressurized Reactor of the Flamanville type — the world's safest and most powerful — in Abu Dhabi and China.

There is pride in French exceptionalism and in the technical skill that has produced an industry with no major accidents. In a recent op-ed article in Le Figaro, for example, Yves Thréard boasted: "France hasn't any oil, but she knew how to exploit a rich idea. In the whirlwind of globalization, civil nuclear power became a weapon, commercial and political, that allowed the country to remain at the avant-garde in the concert of nations."

A senior aide to Jean-Louis Borloo, the minister of ecology, sustainable development and planning, said that France "sees a wide trend developing" toward more use of nuclear energy.

"A lot of countries realize that with the rising price of fossil fuels and energy, and the climate emergency, nuclear can be part of the solution," said the aide, who spoke anonymously under the rules of his ministry.

He said that France's choice for a "closed fuel cycle" — reprocessing used nuclear fuel to recover plutonium made in the reactors so it can be reused — was safer. "This way, nuclear energy can bring a lot — it's CO2-free energy."

Mr. Sarkozy said that each European Pressurized Reactor that “replaces a gas-powered electricity plant saves two billion cubic meters of gas each year, and each E.P.R. replacing a coal plant means cutting 11 million tons of CO2.”

France generates half of its own total energy, up from 23 percent in 1973, despite increased consumption.

Electrical power generation accounts for only 10 percent of France’s greenhouse gases, compared with an average of 40 percent in other industrialized countries, according to EDF.

France has 58 operating nuclear reactors, the highest number of any nation besides the United States. In America, where nuclear construction has been moribund, there is also new interest. At the moment, 19.4 percent of the electricity generated in the United States is from 104 nuclear plants, according to the Department of Energy.

The Nuclear Regulatory Agency has in hand or expects applications to build 34 reactors, of which seven are European pressurized water reactors of the Flamanville type — and, unlike current American reactors, allow output to vary to meet fluctuating demand.

The Flamanville reactor is based on a French-German design, which itself is based on an earlier Westinghouse design. EDF has an American partner, Constellation Energy, to sell the new model as a joint venture called UniStar Nuclear, which has already ordered some of the larger parts for one reactor. Ironically, its main competitor is Westinghouse, now owned by Toshiba.

For all the happy talk in France, however, there are continuing doubts and confusion about nuclear power, accentuated by a series of accidents and alerts in July. At a nuclear plant in Tricastin, in Provence, 163 pounds of untreated uranium in liquid leaked from a faulty tank during a draining operation, seeping into the ground and then into rivers that flow into the Rhône.

While the two-year-old Authority for Nuclear Security, an independent body overseeing civilian nuclear activities, called it a category one (out of seven) incident that posed no health risk, the local prefect banned fishing, irrigation, swimming and the use of well water. The ban lasted 14 days, and the government criticized Areva, the nuclear group that is mostly state-owned, for not informing local authorities quickly or adequately. The treatment station, which was old, was being replaced, and remains shut.

Other minor accidents occurred in quick succession: a burst underground pipe at another site north of Tricastin, which leaked a tiny amount of uranium inside plant grounds, and then another accident at Tricastin itself, when 100 employees were contaminated by radioactive particles that escaped from a pipe.

The government, Areva and EDF have played down the accidents. Mr. Borloo said there were 86 category-one nuclear incidents in France in 2007 and 114 in 2006. Mr. Borloo’s aide, pointing to the Authority for Nuclear Security, said the Tricastin “microevent” showed that “our system of security is extremely responsive and transparent, and that the media and public opinion needed a training period to understand how the system of nuclear security works in France.”

Still, there is continuing nervousness. Sales of bottled water increased, and even a nearby appellation of local wine, Côteaux du Tricastin, is exploring whether to change its name, according to Henri Bour, who runs the local wine council.

A prominent French anti-nuclear lobby, Sortir du Nucléaire, is pressing to phase out nuclear power, which it considers too dangerous and too expensive because of the need to manage nuclear waste. The group wants a “sustainable transition” to renewable energy options like solar, hydro and wind power. Last year, on the 21st anniversary of the Chernobyl meltdown, 30 protesters at Flamanville blocked entrances and chained themselves to cranes.

There have also been some construction issues. In April, the Authority for Nuclear Safety criticized some of the welds and the quality of the concrete work at Flamanville, but work resumed in June. Philippe Leynié, the site manager here for EDF, said the problem involved missing pins on the metal rebar and was not serious.

Nonetheless, an IFOP opinion poll conducted for Le Monde after the Tricastin leaks showed that 67 percent of the French considered it vital to keep nuclear power in the country’s energy mix, compared with 52 percent in 2002. Only 27 percent judged the risks of nuclear energy to be the most worrying, compared with 50 percent who thought global warming was the predominant risk. In 2002, 33 percent worried most about nuclear risks and only 20 percent about global warming.

For Flamanville, though, a village of 1,780 people, nuclear power has re-energized the town. There are no pretty beaches here, just granite cliffs above a cold sea. For hundreds of years, the village lived off the granite, cutting and selling it, shipping it first by boat, then by railroad. Flamanville granite, said Mayor Patrick Fauchon, was used to pave the Place de la Concorde in Paris.

But by the middle of the 19th century it became too expensive compared with other sources, and the village survived by digging iron from an undersea mine, said Mr. Fauchon, who has been mayor since 1983. “It was always a company town,” he said.

But the mine closed in 1962, and the population of the village dropped to 1,150 people. When the idea of a nuclear plant arose, in 1975, there was considerable debate. But residents voted for the nuclear plant, which meant new jobs.

The granite cliffs and cold sea, while not hospitable to bathers, were ideal for these nuclear reactors, which need a hard foundation and access to plentiful cold water.

Now, after so many years, a generation of workers here has already retired from the nuclear industry.

“At the regional level, some towns accept having nuclear plants and others oil refineries,” Mr. Fauchon said. “I don’t ask Bretons if they’re happy about having pigsties and raising pigs, which creates another source of pollution.”

Still, he thinks these days of the effect on towns that are losing their regiments as France’s military modernizes. “At least when we speak of energy, it’s a permanent

need," Mr. Fauchon said. "When we speak of an industrial tool with a lifespan of 60 years, we have economic activity for two generations."

Maïa de la Baume contributed reporting from Paris, and Matthew L. Wald from Washington.

China To Build More Nuclear Power Plants Than Planned
By Victoria Ruan
Xinhua/Dow Jones
August 15, 2008

BEIJING -(Dow Jones)- China aims to let nuclear power capacity account for more than 5% of the country's total power capacity by 2020, an increase from the originally planned 4%, the official Xinhua News Agency reported late Friday, citing a senior energy official.

Zhang Guobao, head of the newly-established National Energy Bureau, said China will speed up building nuclear power plants at coastal areas and also plans to do so at some inland areas, according to the report.

China currently has 11 nuclear generators with combined installed capacity of 9.08 million kilowatts, accounting for 1.3% of the country's total power capacity, the report said.