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BACK TO SQUARE ONE ON NUCLEAR EXPORTS IN GERMANY

The new conservative-liberal government in Germany so far has been hesitant to go full speed in their support for nuclear energy. So far they still stick to the nuclear phase out and pretend to be tough towards the energy utilities, which want to operate their nuclear power plants longer.

(703.6007) Urgewald - This hesitant behavior is due to the elections taking place in the federal state of North Rhine-Westphalia in May where the same coalition of Christian Democrats and Liberals ruling the country has been working in a coalition over the past years and fears for its majority.

However, there are areas where the pro-nuclear take of the government becomes crystal clear. On Wednesday, 27 January, the budget committee of the parliament was informed about a huge guarantee for Areva NP (34% Siemens) for the Brazilian nuclear power plant Angra 3. This was the last step in getting rid of the exclusion criterion for guarantees for nuclear exports, which had been in place since 2001. It prevented export credit guarantees to be granted to Areva/ Siemens for Olkiluoto 3 and an earlier attempt for Angra 3.

Yet the coalition treaty mentioned that the government wanted to get rid of the Hermes guidelines containing the exclusion criterion. Shortly after the elections Areva/Siemens handed in an application for guarantees over 2,5 billion Euro (US$ 3.5 billion) for Angra 3. Although Siemens is in the process of ending its 34 % stake in Areva NP German law makers nor the majority of parliamentarians seem to be aware of the possibility of ending up financing a French state-company.

As the contracts for Angra 2 (ready built) and Angra 3 were set up in the 70's and plans were made at that time, Angra 3 is old technology before the building even starts, the plant being a second generation design. Further problems are that the plans for storage of radioactive waste are poor, provisional and not very advanced, that the Brazilian nuclear regulator is not an independent body, but has direct commercial interests in the Angra 3 project: the group providing the fuel to power Angra's reactors is part of the regulatory body, according to Greenpeace in its "Financing Brazilian nuclear programme: a risky investment" (November 2009). The emergency management has been strongly criticised and the environmental minister gave the license only with over 40 additional requirements, experts doubt whether the energy utility Electronuclear will be able to fulfil these requirements. One might wonder, too, whether it is the wisest decision to build a nuclear power plant in the only earthquake prone area in Brazil.

Despite parliamentarians brought up these critical questions in the budget committee discussion, the ruling majority accepted the assurance of the economics ministry that all was fine and in order and

MONITORED THIS ISSUE:

nothing to worry about with the project. This means back to square one on the German nuclear export promotion and if Angra goes through smoothly one can only wonder what else will follow.

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GERMANY WILL RETRIEVE ASSE WASTE

An inventory of 126,000 drums of low- and medium level radioactive waste, placed in the former Asse salt mine in Lower Saxony between 1967 and 1978, will be brought to the surface and reconditioned if necessary. No final decision has been made about where to move the waste.

(703.6008) WISE Amsterdam - Wolfram Koenig, president of the German Federal Radiation Protection Agency, BFS, and Norbert Roettgen, since last fall Germany's federal nuclear regulator and in charge of the Federal Ministry of Environment & Nuclear Safety, BMU, made statements mid January indicating they both agreed that retrieving the waste was the best option.

During 2009, BFS internally evaluated several options for decommissioning and closing the Asse repository. The office also considered moving the waste to 1,000 meters underground at Asse or filling the mine with water and sealing it, but decided that removing it was the safest option for the long term. Koenig said the operation would be a "great scientific and technical challenge," with the BfS planning to present soon a concept on how best to proceed.

The German section of Friends of the Earth, BUND, said it was unclear where the waste will go once extracted from Asse. But press reports said that it would be stored in an old iron ore mine called Konrad Shaft near Salzgitter, which would then become Germany's first permanent storage site for nuclear waste.

Asse was commissioned in the 1960s by federal and state government agencies, without a formal nuclear licensing process, on behalf of waste producers. According to some German waste management officials, unless the federal government took control of the project, some utilities would not have agreed to commit themselves to invest in Germany's initial nuclear power plants.

Extracting the waste is expected to be a laborious, hazardous and expensive operation. According to BFS officials, retrieving all the waste would take about a decade and cost at least 2 billion Euro (US$ 2.9 billion), while press reports mention it could cost as much as four billion Euro (US$ 5.8 billion). BFS is also preparing "emergency measures" in case of an enormous increase of flooding, and if it is determined that some of the containers are dangerously corroded, then removing them will be reconsidered.

It is uncertain who will ultimately pay for retrieving, repackaging, and disposing of the Asse waste. Before the last federal coalition government was voted out of power in September, then BMU-minister Sigmar Gabriel asserted that waste producers, including power reactor owners, should pay for the decommissioning of the site. But reactor owners of course disagreed, saying that, since the Asse project was led by the federal government's research ministry, the federal government should pay for it. Last week, Germany's research minister, Annette Schavan, said in interviews that the Asse mine was "more intensively used" by industry than would have been justified had Asse been solely a research project.

The Asse mine in central Germany, used to store waste from 1967 to 1978 between 500 and 700 meters underground, has been known for some time to be leaking and in danger of partial collapse. At first the barrels were stacked in an orderly manner, but in the 1970s they were simply dumped in and covered with the salt grit, with the result that many are now corroded and dented. Although Asse is a disposal site for low- and intermediate level waste, that does not automatically mean there are no highly radioactive substances. Last August it was published that in the Asse pit, around 28 kg of plutonium, more than three times as much as previously assumed, is evidently being stored.

Exactly 200 issues ago, in issue 503 of this magazine (which was called the WISE News Communique by then), we published the following In Brief.

Asse storage is leaking. From 1967 to 1977, low and intermediate radioactive waste was stored in the former salt mine in Asse, Lower Saxony, Germany. There it is supposed to be stored in dry salt. Now water is seeping through to the waste drums. The environmental ministry of Lower Saxony confirmed the leakage on November 6.

At present about 10 cubic meters of water is pumped away daily. The drums are in danger of rusting. Experts are trying to find solutions to this problem. Since 1995 salt from another Kali-mine close to Hannover has been added to the Asse mine to cover the waste. The leakage of the soapy water (alkaline solution) had first been discovered in 1991, and from 1993 on, it slowly increased. But the environment ministry isn't yet considering 'evacuating' the 127,000 drums to another site. This would only be considered in a "worst case" scenario. Instead, it should be tried to make Asse water-proof again.

From WISE News Communique 503; 4 December 1998

Sources: Parliamentary questions, 24 November 2009, European Parliament / AFP, 15 January 2010 / Nucleonics Week, 21 January 2010

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FRENCH NUCLEAR HYPOCRISY: AREVA TO SELL OLD REACTORS

The United Arab Emirates dropped a bomb in the nuclear energy world by choosing South Korean nuclear technology over western reactors. Market analysts and company strategists need to swiftly adapt to a new nuclear market outlook. Following this serious setback, the French nuclear giant AREVA now considers selling older generation-two reactors to countries that are new to nuclear power, even though safety standards in Western countries would not allow these old designs to be built.

(703.6009) Greenpeace International - The US$20 billion (14.2 billion Euro) tender for four reactors in UAE was highly contested, with GE/Hitachi and a French consortium of AREVA, GDF Suez, Total and EDF competing with the South-Koreans to build the first Arab nuclear power reactor. The South-Korean reactors were selected over France's nuclear flagship the EPR (European Pressurized-water Reactor), and AREVA is now picking up the pieces after this rather humiliating defeat in Abu Dhabi.

Though the low costs of the South-Korean reactors are generally thought to be the main driver behind UAE's choice, other factors have played a significant role. Serious delays and cost overruns at the first EPR under construction in Olkiluoto, Finland, have shed doubts on AREVA's ability to live up to its promises. Also the more and more public row between AREVA and EDF, the other French nuclear company, has not helped in securing the billion dollar bid in UAE. EDF was requested to join the EPR consortium that ran in the UAE tender, but was, according to AREVA CEO Anne Lauvergeon, too late in responding. The nuclear power struggle between the French giants has since deepened, the companies disputing uranium enrichment and nuclear fuel processing (see box).

The South-Korean government and KEPCO, the company leading the consortium in the UAE bid, seemed to relish in the unexpected triumph. The first nuclear power plant in the Arab Gulf will be the first nuclear reactor exported from South-Korea. The South Korean government immediately fantasizes of expanding its nuclear industry, targeting a 20 percent share of the global nuclear reactor market by 2030 through exports of 80 nuclear reactors. The KEPCO reactor is an updated second-generation 1,400 MW light water reactor APR-1400 (Advanced Pressurised Reactor), of which the first two are currently under construction in its home country.

The UAE decision sparked an internal review of AREVA's product range. The company considers reintroducing second-generation 1,000 MW reactors for client countries that are new to nuclear power. These reactors will be cheaper and less sophisticated than the third-generation EPR reactor that has been marketed aggressively by France all over the world.

According to a senior AREVA executive, 'safety standards in the US and Europe would not allow a second-generation reactor to be build'. However, this does not stop France to consider selling the older, simpler designs to countries without any previous nuclear experience. The French president Sarkozy even endorses the need to broaden the array of nuclear offerings in order to prevent further failures to win

Nuclear turbulence.
The sibling rivalry between the French nuclear giants AREVA and EDF has become a public fight, with the French prime minister Fillon acting as referee. The ego's of the companies' CEO's, Anne Lauvergeon for AREVA and Henry Proglio for EDF, seem too big for one room, and media jump eagerly on each blaming the other for failing to keep promises and responsibilities. The pot calling the kettle black.....

AREVA blames EDF for signing a contract for enrichment services with the Russian company Tenex. EDF seeks to diversify its supplies of nuclear fuel from non-French enrichment suppliers like the Anglo-German-Dutch Urenco and Tenex, instead of continuing to take uranium from the French enrichment facility Eurodif. Eurodif still uses gas diffusion technology, while the new Georges Besse II centrifuge enrichment plant is planned to be fully operational only in 2012. Unless EDF agrees to buy services from the Eurodif diffusion plant after 2009, AREVA could be forced to cancel the scheduled initial production in the new Georges Besse II plant. Though this might be an empty threat, it is clear that AREVA needs EDF to buy enrichment services in order to make a smooth transfer from gas diffusion to the new centrifuge plant. A committee of AREVA officials have denounced EDF's uranium contracts with the Russians as 'non-patriotic' and 'anti-European'.

On top of that, in the beginning of January 2010 AREVA has stopped removing spent nuclear fuel from reactors for reprocessing at the facility in La Hague, Normandy. EDF and AREVA have not been able to agree on a new contract to continue reprocessing of spent fuel from EDF's nuclear power plants. The new reprocessing contracts have been disputed for many months without any progress. The previous contract to reprocess spent nuclear fuel at La Hague, which expired in 2008, was worth 800 million Euro (US$1.15 billion) per year. At the end of 2008, the companies agreed on a framework for contracts for the 2008-40 period, but since mid-2009 have not been able to settle disagreements over prices and volumes.

The French nuclear row plays in a setting in which the whole nuclear sector in France is challenged on its transparency on nuclear waste issues. The documentary 'Waste, the nuclear nightmare', aired in October 2009, has sparked a national debate on nuclear waste in France. The High Committee for Transparency and Information on Nuclear Safety (HCTISN) conducts a full inventory of France's nuclear waste products and transports. Greenpeace has blocked uranium transports to Russia several times, calling for a moratorium on the waste transports to Russia.

deals: "There is no doubt that we need to restructure the sector and there is no doubt that we need to raise the issue of coming up with a broader set of offers." AREVA estimates that 20 per cent of the global market could be open to second-generation reactors. Rumors suggest EDF may take the lead in selling these reactors in markets new to nuclear energy.

Sources: Financial Times, 14 & 19 January 2010 / The Times, 18 January 2010 / Nuclear News Flashes 13 January 2010 / Reuters, 22 January 2010 / Greenpeace Nuclear Reactor weblog 7 December 2009.

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SOUTH KOREA WANTS 'NUCLEAR SOVEREIGNTY'

Since a Korean consortium led by the state-run KEPCO won a US$20 billion nuclear power plant project in the United Arab Emirates late last year, much is being talked about the country emerging as a global leader in the use of nuclear power.

(703.6010) WISE Amsterdam - South-Korea's administration led by Lee Myung-bak plans to turn Korea into a new export powerhouse of nuclear power plants by building 80 nuclear reactors worth US$400 billion around the world over the next 20 years. But discussion in the country is heating about "restoration of its right to reprocess spent fuel," as the Korean Herald described it in an editorial in its January 15 issue.

So, attention is directed to the 1973 Korea-U.S. Peaceful Nuclear Cooperation Agreement which provides various restrictions on Korea's handling of nuclear materials, requiring prior U.S. consent to the reprocessing of used nuclear fuel. The bilateral agreement expires in March 2014 and the two countries have to negotiate a replacement agreement. Late January the two countries will meet to hold behind-the-scenes discussions about the issue. "Korea has pressing needs to change the pact to a less restrictive one so it could engage freely in the global (peaceful) nuclear power market", according to another editorial in the country's English Daily. Reprocessing is said to be important too, to "resolve the growing amount of spent fuel by reprocessing it on its own." When nuclear proponents talk about solving the waste problem, they usually mean postponing (the need for) a disposal solution.

As of the end of 2009, about 10,800 tons of spent fuel is stored in temporary pools at nuclear power plants and with the addition of some 700 tons each year from 20 reactors these pools will be full by 2016. In order to dispose of the large volume of spent fuel from the existing reactors and those to be built in the future, Korea will need a storage site 30 to 40 times larger than the low-level waste storage site near Gyeongju that the government secured through so many difficulties at so much cost.
Given the U.S. proliferation concerns on the Korean Peninsula heightened by North Korea's nuclear arms program, getting a more 'liberal" nuclear cooperation agreement ratified by U.S Congress will be sensitive. Sending the waste to European reprocessing plants (in La Hague or Sellafield) would be another 'solution' but really not favoured by the South Korean who wish to obtain "Nuclear sovereignty".
Representatives of the two countries will meet also at the second preparatory meeting on Febr. 9 in The Netherlands for the Nuclear Security Summit in Washington in April. US president Barack Obama has announced his intention to host an international Nuclear Security Summit last year. After almost a decade (since 9/11) fighting nuclear terrorism, characterised by at hoc initiatives aimed at curbing the illegal trafficking of nuclear related material, the new US administration seems to be eager to work in order to coordinate the different bilateral and multilateral programs and achieve some sort of institutionalization of the different initiatives. The Nuclear Security Summit might be the first building block of a new international nuclear proliferation regime but in order to reach a successful conclusion the US government will have to weigh the advantages of institutionalization against the need for flexibility and wider participation. In May the (5 yearly) review conference of the Nuclear Non-proliferation Treaty takes place in New York.

Korean research reactor for The Netherlands?
South Korea is not only planning to become a dominant factor on the nuclear power reactor market, but also on the research reactor market. Korea won the contract for a nuclear research reactor from Jordan in December. The Korean consortium (KAERI, Korean Power Engineering Co and Dosan Heavy Indsutries & Construction) is planning to bid again in case The Netherlands conducts another international tender for the construction of a 80 MW(t) research reactor to replace the High Flux Reactor in Petten. The Netherlands (NRG, the operator), selected Argentina's INAVP in June last year as the priority partner, but on January 15, according to KAERI the negotations with INVAP where called off. KAERI said that "The Netherlands is likely to conduct another international tender in the second half of this year". As it wins the contract, Korea is expected to dethrone Argentina as the world leader in nuclear research reactors. NRG is not willing to comment in this stage, a press release will follow (but after the deadline for the Nuclear monitor)
The Dong-A Ilbo, 26 January 2010

South Koreas nuclear sovereignty #1
In 2004 South Korea admitted that it had an AVLIS (Atomic Vapor Laser Isotope Separation) enrichment program from 1991 to 2000, and that it had also extracted plutonium in 1982 and had declared neither activity to the IAEA. Following Seoul's disclosure, the IAEA launched a full investigation into South Korea's nuclear activities. In a report issued on November 11, 2004, the IAEA described the South Korean

government's failure to report its nuclear activities a matter of 'serious concern'. The Board of Governors decided to not make a formal finding of noncompliance, and the matter was not referred to the Security Council. This although the country did not have a very good proliferation track record.

It was commonly known that from 1968 to 1975 South Korea attempted to obtain both a plant to reprocess plutonium from spent fuel (the 'reprocessing plant') and intermediate-range missile delivery systems. After 1971, an organized South Korean effort to develop a bomb was orchestrated by the Weapons Exploitation Committee with presidential-level backing. After pressure by the US and the threat to rupture the US-South Korean alliance the country terminated (alledgedly) its nuclear wepaons program in 1975; in April 1975 South Korea signed the Non-Proliferation Treaty and a few months later in November a full-scope safeguard agreement.
But in the early 1980's specialists were aware that KAERI (Korean Atomic Energy Research Institute) was conducting reprocessing experiments. In 1984 the US halted a Canadian transfer of mixed oxide fuel-related reprocessing technology to South Korea. Certainly after the military dictatorship was overthrown in 1987, there were many voices that the country should obtain its own nuclear weapons.

Sources: Korean Herald, 15 & 20 January 2010 / The Korea Times, 24 January 2010
/ ISPI Policy Brief: "Obama's 2010 Nuclear Security Summit and the International Non-proliferation Regime", October 2009 / Bulletin Of The Atomic Scientists, Jan/Febr. 2005

THE TRUE RISKS OF LOW LEVEL RADIATION

Thyroid cancer rates in Pennsylvania (USA) soared in recent decades and radiation from nuclear power plants may be the cause. This is the result of a study which was recently published in the International Journal of Health Services. Its author, Joseph Mangano, is the executive director of the Radiation and Public Health Project. He calls the observed growth in thyroid cancers "an epidemic." And there is much more evidence of the true risks of low level radiation.

(703.6011) WISE Amsterdam -
Pennsylvania's incidence of thyroid cancer in the mid-1980s was 40 percent below the national rate, and now the rate is 44 percent above the national rate, he said, adding: "Something occurred to change Pennsylvania's rate from low to high, and one of these possible factors is radiation from reactors." Some of the highest thyroid cancer rates occur in eastern Pennsylvania, which has the nation's largest concentration of nuclear reactors, including the Susquehanna Steam Electric Station in Salem Township, he said. Other reactors are Three Mile Island in Dauphin County, Peach Bottom in York County and Limerick in Montgomery County. Seven continue to operate.

Some of the highest thyroid cancer rates - 80 percent above the national rate - are in Sullivan, Luzerne, Carbon, Northampton, Lehigh and York counties, according to his research.
Mangano noted that the radiation released from these reactors is relatively low, and not the high levels associated with the Chernobyl accident or the atomic bomb at Hiroshima. But the effects of low-level radiation needs to be explored further as a public health concern, he said, because radiation exposure is the only known cause of thyroid cancer. Mangano pointed to a 1999 study by the National Academy of Sciences that found more than 200,000 Americans developed thyroid cancer from above-ground atomic bomb tests in Nevada, which emitted low levels in the 1950s and 1960s.
Nuclear reactors also release low levels of radiation and these small metal particles come into contact with humans through the air, rain and snowfall and also enter the food chain. Once radiation enters the body, it seeks out the thyroid gland, damaging or killing cells, reducing hormones and causing disease and cancer, according to Mangano. Nuclear power plants emit extremely low levels of radiation - far below background levels in the area, said Joseph Scopelliti, a spokesman for PPL, which operates the Susquehanna plant. Mangano released similar study results in November pointing to high thyroid cancer rates in the counties surrounding the Indian Point nuclear power plant, which is 35 miles north of Manhattan in New York State. Those rates were also among the highest in the country, according to a news release.

Leukemia.
In the late 1980s and early 1990s, several studies revealed increased incidences of childhood leukemia near UK nuclear facilities. However, official estimated doses from released nuclides were too low, by 2 to 3 orders of magnitude, to explain the increased leukemias.

Recent epidemiological studies have reopened the childhood leukemia debate. Baker and Hoel(*1) carried out a meta-analysis of 136 nuclear sites in the UK, Canada, France, US, Germany, Japan and Spain and found cancer death rates for children were elevated by 5 to 24 per cent depending on proximity to nuclear facilities. Hoffmann et al (*2) found 14 leukemia cases between 1990 and 2005 in children living within 5 km of the Krümmel nuclear plant in Germany, significantly exceeding the 0.45 predicted cases.

Most important, however, is the KiKK study (Kinderkrebs in der Umgebung

von Kernkraftwerken = Childhood Cancer in the Vicinity of Nuclear Power Plants) Spix et al (*3) and Kaatsch et al (*4). The main findings were a 60% increase in solid cancer risk and a 120% increase in leukemia risk among young children living within 5 km of all German nuclear reactors. These are big increases in risk.

The KiKK report is significant because it is a large and well-conducted study; because it is scientifically rigorous; because its evidence is particularly strong; and because the German Government, which commissioned the study, has confirmed its findings. Over 60 other studies world-wide have investigated child leukemias near nuclear facilities (*5). The large majority of these studies have found increased incidences of leukemia: this lends considerable support to the KiKK findings.

The KiKK observations are presently the subject of intense research and discussion throughout the world, including at least three studies in the UK. Last November, the Department of Health requested the Government's Committee on the Medical Aspects of Radiation in the Environment (COMARE) to examine the German study and report back.
Also last November, in a case of unfortunate timing, the UK Department of Energy and Climate Change (DECC) published a Consultation paper justifying the radiation exposures from its proposed new nuclear stations. The problem is that COMARE's report will not be finished until after the Consultation's February 22 deadline, and DECC has refused public requests to extend its deadline until the COMARE report is finished. This is unfortunate and it is an unreasonable position for DECC to take. It is clearly important that we get to grips with the KiKK evidence before decisions are made on building more nuclear power stations.

In 2009, the UK Health Protection Agency submitted a memorandum (*6) on health risks from radiation to the Government's Consultations. This seeks to diminish the KiKK study and devotes only half a page to the lengthy KiKK report. The HPA's criticisms are cursory, poorly argued and misleading. For example, the HPA memorandum seeks to argue that the KiKK study merely found an association between nuclear power plant proximity and risk, ie and not between dose and risk - implying that radiation exposures were not a causative factor. This is unpersuasive: childhood leukemia is well known to be closely associated with radiation exposures. The HPA memorandum also states that a UK study and a French study "have not replicated" the KiKK findings. This is misleading as the two studies actually did find small leukemia increases in children near nuclear power plants. Their data were not statistically significant but this was due to the smallness of the studies and not the absence of effect. The HPA's view remains that official estimated doses from NPP releases are much too small to result in the observed levels of leukemia. But the CERRIE report (*7) showed that there could be very large uncertainties in official dose estimates from inhaled and ingested radionuclides.

Radiological Risk Theories
• "Linear NoThreshold" (LNT). This theory is used by the world's radiation authorities — UNSCEAR, ICRP, UK HPA, US BEIR, etc – to estimate risks at low doses. It presumes that risks decline proportionately as you lower the dose all the way down to zero, and that the only dose with no effect is zero mSv. In other words, under LNT there is no safe dose of radiation: no matter how low it is, a small risk remains. The LNT model's virtue is its simplicity as radiation exposures can be added from different times/ sources to compare with dose limits, and can be added to form population (ie collective) doses.
• "Sub-linear": which postulates that low levels of radiation are proportionately less harmful than a linear relationship
• "Hormesis" approach: exposure of a cell or organism to a low dose results in an adaptive stimulatory/beneficial outcome, while exposure to a high dose results in an inhibitory / detrimental outcome: "radiation is good for you"
• "Supra-linear": the often ignored hypothesis that low levels of radiation are proportionately more harmful than a linear relationship

CERRIE was an independent Committee established by the UK Government in 2001, following concerns about the risks of internal radiation, including reports of increased incidences of cancer near nuclear sites and after Chernobyl. The Committee operated between October 2001 and October 2004. Although the commission found no clear evidence to date that current radiation risks were substantially wrong, it advised that greater attention should be paid to uncertainties and tougher action is needed to allow for new information about the risks from internal radiation. Uncertainties about the risks mean that in some cases we might be exposed to 10 times the risk previously thought, while in other cases the risk may be almost zero. Uncertainties in current methods of estimating risks from internal radiation require policy makers and regulators to adopt a precautionary approach when dealing with exposures to internal radiation. The CERRIE report warned also that newly discovered effects of radiation, genomic instability (ongoing, long-term increase in mutations within cells and their offspring), bystander effects (cells next to those that were irradiated can also be damaged), and minisatellite mutations (inherited germline DNA changes) are real biological events that need further research.

The nuclear establishment approach (the ICRP – International Commission on Radiological Protection - an advisory body providing recommendations and guidance on radiation protection) and the hormesis approach treat radiation as if it were equally distributed in the body.

The nub of the issue is that there are some kinds of radiation exposure which are uniform, that is evenly distributed in the body. This applies to forms of external radiation, eg. x-rays and gamma rays. But internal radionuclides which are inhaled or ingested may not be evenly distributed, so that their damage is concentrated in some areas and not others. Auger emitters and low range beta emitters such as tritium are examples.

In these circumstances, as the CERRIE Report hinted in 2004, the concept of "dose" may be meaningless for internal emitters. So we should be very careful when using "dose" to describe the effects of internal radiation.

The main reason the nuclear establishment sticks to using dose is they got used to using it for external radiation and tried to extend it to internal radiation. But it really should not be used for this: internal concentrations of radionuclides (Bq per kg) should be used instead.

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(Thanks to Ian Fairlie and Karin Wurzbacher)

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HEU FROM TURKEY & ISRAEL RETURNS TO U.S.

The last 'significant' amount of highly enriched uranium (HEU) research reactor fuel in Turkey has now been returned to the USA for secure storage, the US National Nuclear Security Administration (NNSA) has announced

(703.6012) WISE Amsterdam - The return of the 5.4 kilograms of HEU fuel is part of the NNSA's Global Threat Reduction Initiative (GTRI), which the NNSA claims has now removed all significant amounts of HEU from 17 countries. According to NNSA, the removal of HEU eliminates potentially weapons-usable material from civilian sites, resulting in a permanent threat reduction.

The material was removed in cooperation with the Turkish Atomic Energy Authority (TAEK) and the Cekmece Nuclear Research and Training Center. TAEK took delivery of the French-made low-enriched fuel it needs to power its reactor in November 2009, and the HEU fuel was formally shipped on 14 December that year. The HEU fuel was packaged into an internationally licensed transport cask before being transported under armed convoy from the reactor site to a nearby port for onward shipment to the USA.

The amount of fuel needed to power a research reactor can be measured in terms of kilograms of uranium rather than the tonnes of low-enriched uranium fuel needed in a power reactor but it is higher in fissile uranium-235. This, in turn, makes it a potential nuclear proliferation risk - HEU fuel could theoretically be used to make a crude nuclear weapon. Since the late 1970s, international efforts have been under way to ensure that the world's research reactors would use fuel enriched to lower levels.

Most research reactors using HEU fuel were supplied by the USA and Russia. In 1978 the USA launched its Reduced Enrichment for Research and Test Reactors (RERTR) program, with the aim of converting reactors using HEU fuels to lower enrichment fuels where technically feasible or practical. Today, RETR comes under the auspices of the NNSA's GTRI, which works to remove Russian- and US-origin fresh and used HEU fuel to its country of origin.

Israeli HEU returned too

The NNSA announcement trumpeting the return of the Turkish HEU omitted to mention a simultaneous delivery of US-origin HEU fuel from Israel.

As reported in Frank Munger's Atomic City Underground blog, the NNSA confirmed a report by Friends of the Earth's (FoE's) Tom Clements that a shipment of 102 used fuel assemblies from Israel had been returned to the USA under the GTRI. Munger noted that an NNSA spokesperson confirmed that the Israeli shipment arrived at Savannah River in January, "in conjunction with a US-origin fuel return from Turkey," but would give no further details. It would seem likely that the material came from the 5 kWt Israeli Research Reactor 1 (IRR-1), which was built under the Atoms for Peace program and has been operational since 1960. A total of 19 kg HEU reactor fuel was shipped from the US to Israel from 1960-1975. The majority of the material was fuel for the IRR-1. This pool-type reactor began operating in June 1960 and is used for on-line isotope seperation, training and activation analyses.

The Israeli Research Reactor-1 is located at the Soreq Nuclear Research Center (about 35 miles south of Tel Aviv) and was also purchased from the U.S. The center was built in the late 1950s. According to NTI Israel profile it is widely

believed that the main function of Soreq research center in recent years has been to conduct nuclear weapon research and design.

Conversion of reactors to run on lower enriched fuel has necessitated the development of suitable fuels for the different specifications of reactors around the world, work which is still ongoing. According to NNSA estimates, some 78 research reactors have a defence-related mission or are of a unique design and are not convertible to LEU fuels. The NNSA aims to have all the other reactors using HEU fuels converted to LEU by 2018.
Source: World Nuclear News, 14 January 2010 / Appendix I, Agreements with foreign countries. Available at: http://www.fas.org/sgp/othergov/doe/heu/appe.pdf /
NTI Israel country profile: http://www.nti.org/e_research/profiles/Israel/Nuclear/3583.html
Contact: WISE Amsterdam

IN BRIEF

Germany: phasing out the phase-out. Utility companies and the government have agreed to allow two nuclear power plants that were scheduled for closure soon to keep operating. The two older reactors scheduled to be taken offline in the near future, Biblis A in Hesse and Neckarwestheim I in Baden-Württemberg, will remain operational until the current government finalizes its general energy program, expected in October. The move appears to be another step in reversing a 2001 plan passed by Germany's Social Democratic-Green party government under Gerhard Schröder to eventually phase out nuclear power in Germany. According to the media report, energy companies are using something of an accounting trick to enable the plants to stay online: unused allocations of electricity from newer plants will be transferred to the Biblis and Neckarwestheim facilities. The federal government met with the country's top four energy providers in Berlin on January 21 about possibly extending the life spans of nuclear power plants. While the government played down the meeting as "routine," anti-nuclear activists protested throughout the day.
The Local (Germany), 23 January 2010

UK: Higher-burnup fuel needs century cooling period. The higher-burnup fuel proposed for new reactors being considered in the UK could require a spent fuel cooling period so long that a UK geologic repository, as currently planned, would close before some of the fuel was ready for disposal. The concern surfaced in a response from Westinghouse to a study by the UK Nuclear Decommissioning Authority's Radioactive Waste Management Division, or RWMD, on the "disposability" of waste from the Westinghouse AP1000. In a similar study of the waste from the Areva EPR, the RWMD postulated that a 90- to 100-year cooling period would be necessary for the higher-burnup fuel planned for use in both companies' reactors. As currently envisioned, a geologic repository is "assumed" to accept its first spent fuel and high-level waste around 2075, according to the UK Nuclear Decommissioning Authority, or NDA. A repository is expected to operate 90 years before it is closed in 2165. However, if an AP1000 or EPR begins operation in 2020 — the date assumed in the RWMD studies — and operates for 60 years and the fuel needs 100 years to cool, spent fuel from the final years of reactor operations would not be cool enough for disposal until 2180, after the repository had closed.
More on high-burnup fuel in Nuclear Monitor 671, 17 April 2008: "Too Hot To Handle. The truth of high-burnup-fuel")
Nuclear Fuel, 14 December 2009

Nuclear lobby: 4 key issues for 2010. In the January 2010 issue of Nuclear Engineering International Dan Yurman ("Serving nuclear energy markets since 1989") sees four key priorities for 2010 for a nuclear renaissance in the United States. Priorities, because he sees problems and uncertainties ahead: "Critics are exploiting the fault lines that have already appeared, and some, under the guise of scholarship, cherry pick their sources to make the case for failure. Their objective is to sow fear, uncertainty, and doubt in the minds of business and government decision makers." Stating that "he is not prepared to accept a long term future for the U.S. as being an agnostic on nuclear energy while the U.K. France, Italy, India, China, and other countries put the pedal to the metal to build dozens of new reactors to meet the challenge of global climate change" he analyzes four areas where things have to change.
1- US$200 billion loan guarantees for companies to build new reactors. "Without the loan guarantees, few utilities have the market capitalization to 'bet the company' on a multi-billion dollar investment in a new nuclear reactor."
2- developing a "cadre of nuclear engineers and skilled trades capable of building new reactors on time and within budget". Foreign competition will raid U.S. engineering programs for talent unless the "federal government" (again the government) puts in place a scholarship program.
3- The third priority is "revitalizing U.S. manufacturing capabilities including development of a facility to produce large forgings, e.g., 400 tons or more, for reactor vessels." Because despite increases in capacity, Japan Steel Works (one of the few companies worldwide able to produce those large forgings) reports a three to- four year wait time for 400 ton reactor vessels. Currently three production facilities are under construction in the U.S.: by Areva in Virginia, Shaw in Louisiana, and Babcock & Wilcox/McDermott at locations in Ohio and Indiana.
4- If you think these three are difficult enough, read the fourth critical issue: re-invent the fuel cycle: two strategically located

500 ton/year reprocessing plants; a commercial MOX fuel manufacturing capability and the development of fast (breeder) reactors to “burn the MOX-fuel en complete the fuel cycle”.

It’s time to make clear that nuclear energy had its chance (after 50 years of pouring money in it), admit it is something of the past and move forward to real energy solutions (but, that’s not Yurman’s conclusion).
Nuclear Engineering International, January 2010 / blog Yurman at http://djysrv.blogspot.com/

Albania: Approval of Atomic Energy Agency. On January 20, the government of Albania approved the creation of the country s National Atomic Agency, an institution that is suppose to supervise the development of nuclear projects. Earlier Prime Minister Sali Berisha had announced that the government was looking at the possibility of constructing a nuclear power plant. Albania’s power generation system has not seen major investment since the early 1980s, when the cash-strapped former communist regime stopped investing in new hydropower dams.
Berisha s statements over constructing a nuclear power plant, have drawn interest from Italy Italian energy giant Enel who has expressed interest in locating a nuclear power generating project in the Balkans, possibly in Albania or Montenegro.
The Prime Minister said the government’s goal is to make his country a regional energy superpower. However most commentators believe that Berisha’s statements are little more than hot air and will do little to help end electricity shortages.
Balkan insight, 21 January 2010

Black workers got more radiation. U.S.A.: A Tennessee company that processes nuclear waste has agreed to settle federal claims black employees were subjected to higher levels of radiation than others. The Studsvik Memphis Processing Facility, formerly known as Radiological Assistance Consulting and Engineering, or RACE, has signed a consent agreement with the Equal Employment Opportunity Commission, the Memphis Commercial Appeal reported. Under the agreement, 23 black employees are to receive a total of US$650,000 (461,000 Euro). The EEOC alleged the company assigned black employees to work with radioactive waste and manipulated dosimeters to show lower levels of radiation than the actual ones. Black employees were also paid less and subjected to other kinds of discrimination. Lewis Johnson, president of Studsvik, said the alleged discrimination took place before the Swedish-based company bought the Memphis facility.
UPI, 16 January 2010

Radiation leak at Germany's uranium enrichment facility. A radiation leak at Germany's sole uranium enrichment facility in Gronau (North Rhine Westphalia) has left one worker in hospital under observation. On January 21, in the preparation of a container at the Gronau uranium enrichment plant, a release of radioactive waste occurred. One employee of Urenco Deutschland, who was operating at that time, has been admitted to hospital as a precaution for observation. He was contaminated on hands and feet with UF6 while opening a supposedly "empty and washed" container. It seems he also inhaled some.
He was expected to be released within 24 hours on Friday, but had to stay over the weekend, when uranium was found in his urine. But press reports on Monday claim, he has to stay in hospital longer.
According to the plant's operating company, Urenco Deutschland, there was no danger at any time to the local population. Urenco, is currently determining the cause of this incident, according to their press release.
The national news in Germany reported widely on the accident. Even the prosecutor has started - on demand of local antinuclear organisations - an investigation against Urenco. On January 22 and 24 there were demonstrations in Gronau - with up to 100 people.
Deutsche Welle, 22 January / Urenco press release, 22 January / WDR, 25 January 2010

U.S.: Power to corporate society. On January 21, the U.S. Supreme Court threw out six decades of established law by granting corporations the right to use their incredible wealth and power to influence elections -- thereby diminishing the power of voting.. Imagine ExxonMobil, AIG or Entergy-Louisiana for that matter, throwing huge sums of money directly into Congressional or Legislative attack ads. And this on top of the already unbelievable amount of influence corporations have on elections. Such a scenario used to be illegal. But no longer, since the Supreme Court ruled to lift the ban that kept corporations from contributing directly to campaigns and candidates.
The tortured legal argument is this: We the People are infringing on corporations' "rights" by preventing them from using all of the special advantages they have over real human beings (like unlimited life, limited liability, and lots of other ways of amassing great wealth) to influence political elections. A corporation is not a person. Corporations cannot vote. They do not live, breathe or die - at least not in the way people do and are not a part of "We the People." Giving corporations the rights of people is a cynical political move that fundamentally changes democracy. Unless we stand up, the problem of corporate money in politics could go from bad to unimaginably worse.
Thankfully, some legislators are working to strengthen our campaign finance laws to prevent this. Congress needs to prevent a flash flood of corporate money into elections and there is a need to move fast. The alternative is an undemocratic system in

which large corporations have even more power to drown out the voices of regular voters
U.S. Public Interest Research Groups, www.pirg.org, 21 January 2010

Spain: Nuclear law reformed. Spain's 1964 nuclear energy law is to be reformed to give nuclear plants greater possibility of functioning beyond the 40 years "useful life" for which they were designed, the Council of Ministers decided on December 23. The country's eight nuclear plants must now be owned by a single limited company whose "exclusive object should be the management of the plants", ministers decided. This is to "increase the transparency of the accounts and investments of the installations." Ministers approved a series of measures to "clarify the criteria for the renewal" of operating licences. The 40-year "useful life" has been ratified, with extensions accepted "giving consideration to the general interest and the energy policy in effect, and the security of energy supply." Utilities may now exchange participations to ensure that a nuclear plant belongs to a single company. Many of the eight are shared by two or three utilities, such as Garoña which is to be closed in 2013 shortly after completing 40 years' operation. Garoña's company, Nuclenor, was created by its 50-50 owners, utilities Iberdrola and Endesa.
The ministers also approved tougher nuclear insurance conditions, increasing the obligatory insurance of a plant in case of an accident from 700 million Euro to 1.2 billion Euro (US$ 1.68 billion)
Power In Europe, 11 January 2010

Scotland: New waste policy published. The Scottish Government has published its proposed new intermediate level waste policy which is out to consultation until 9 April. In 2007 the Scottish Government broke away from the rest of the UK by rejecting the idea of a deep geological repository for its higher activity wastes. Instead it favoured long-term storage of waste in on- or near surface facilities, near the site where it was produced. The announcement was widely welcomed by environmental groups, the Nuclear Free Local Authorities and the Green and Liberal Democrat parties.Over the past two years Scottish Government officials have been consulting with stakeholders. The fact this consultation was almost entirely with regulators and the nuclear industry is reflected in changes to the original announcement that are likely to be widely questioned by the same people who initially supported the 2007 decision. It is now proposed that disposal of waste should be the preferred option, rather than storage, unless there are technical reasons why disposal of a waste stream is not possible. The concept of near-surface waste facilities has now been extended to depths of "tens of metres". The principle of waste facilities at or near where it is produced has also been widen to allow greater transport of material over longer distances.
Surprisingly the Scottish Government has also revived a suggestion that storage or disposal facilities might be constructed under the seabed, but accessed from land. When this concept was proposed by the UK Government in the past there was considerable international opposition as its intended that any leakage would go into the marine environment. 'Export' of wastes to the UK or overseas is also explicitly allowed if treatment facilities are not available in Scotland.
Full details of the consultation documents are available at
www.scotland.gov.uk/Topics/Environment/waste-and-pollution/Waste-1/16293/8970
N-BASE Briefing 639, 20 January 2010

WISE/NIRS NUCLEAR MONITOR

The Nuclear Information & Resource Service was founded in 1978 and is based in Washington, US. The World Information Service on Energy was set up in the same year and houses in Amsterdam, Netherlands. NIRS and WISE Amsterdam joined forces in 2000, creating a worldwide network of information and resource centers for citizens and environmental organizations concerned about nuclear power, radioactive waste, radiation, and sustainable energy issues.

The WISE/NIRS Nuclear Monitor publishes international information in English 20 times a year. A Spanish translation of this newsletter is available on the WISE Amsterdam website (www.antenna.nl/wise/esp). A Russian version is published by WISE Russia and a Ukrainian version is published by WISE Ukraine. The WISE/NIRS Nuclear Monitor can be obtained both on paper and in an email version (pdf format). Old issues are (after two months) available through the WISE Amsterdam homepage: www.antenna.nl/wise.

New on NIRS website (www.nirs.org):
January 30, 2010: Safe, Clean Energy Advocates Reject Obama's Call for More Nuclear Power; More Than 3,000 Write Obama in Less Than 48 Hours.
January 30, 2010: Chu Panel Composition Squanders Opportunity to Develop Consensus Radioactive Waste Policy. Politics and Money Trump Science and Reason on Nuclear Waste Panel; Doomed to Fail.
January 29, 2010: Obama Budget Said to Triple Nuclear Loan Guaramtee Program. ACT NOW: Tell Obama and Chu: No Taxpayer Bailout for Dirty Reactors.

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