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Michael,  
here is some information I dug up about Louisiana Energy Services. I urge you to keep them out of Tennessee. We don't want them here. Please don't allow them to come here. They are already trying to dupe our Trousdale County Executive into thinking there will be jobs, etc. just like they did in Louisiana. Make them stop.

Thanks much,

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**LOUISIANA ENERGY  
SERVICES AND URANIUM  
ENRICHMENT**

## **LES Overview**

Louisiana Energy Services (LES) is a consortium of some of the biggest companies in the nuclear power field. LES exists solely to build a new uranium enrichment plant in the United States to supply enriched uranium for commercial atomic power reactors.

In 1989, LES announced plans to build such a plant near the small town of Homer, Louisiana, next to two poor, predominately African-American communities. Facing strong opposition from the local residents, and following an unprecedented legal ruling from the federal Nuclear Regulatory Commission which found that the siting of the plant constituted environmental racism, LES withdrew its application in 1997.

Now, in 2002, LES is back, again searching for a poor, rural community to bear the brunt of its nuclear expansionist plans.

## **THE LES CONSORTIUM**

LES is led by the European firm Urenco, which is itself a consortium composed of British Nuclear Fuels, Ltd.; the Dutch government; and several German nuclear companies. Urenco operates three similar uranium enrichment plants in Europe, at Capenhurst, England; Almelo, Holland; and Gronau, Germany.

The new version of LES has several different partners, three of them nuclear utilities. These include Illinois-based Exelon, the nation's (and, combined with its partner British Energy, the world's) largest nuclear utility; Duke Power, a North Carolina-based nuclear utility; and the Entergy Corporation, which operates nuclear reactors in Louisiana, Mississippi, Arkansas, New York and is currently attempting to purchase a reactor in Vermont.

Other LES partners include the Canadian uranium mining and processing firm Cameco and Westinghouse, which, unlike the U.S. media giant that owns CBS, is owned by British Nuclear Fuels and is the world's largest manufacturer of nuclear reactors.

Duke Power and Entergy Corp. are the only two of these partners involved in the original LES consortium.

Financial documents on LES probably will not be made available unless and until the company applies for a license application from the federal Nuclear Regulatory Commission (NRC). Although the make-up of LES is different than it was in 1989, the basic concept behind the corporation is likely the same.

Under this concept, LES would be a Limited Liability Corporation. Each of its partners would establish a new subsidiary, which would be the actual owners of LES, thereby shielding the assets of the parent companies from any liability associated with building, operating, or decommissioning the LES facility. Each of the partners would put in a relatively small amount of money for the project, based on their shares of the LES company; to actually build the plant, LES is likely to try to raise money from other outside investors.

In the early 1990s, LES partners Duke Power and Northern States Power (NSP is not a partner of the current LES) attempted to recoup their investments in LES from their states' electric ratepayers, but were denied such recovery from their states' Public Utility Commissions, leading both utilities to state that they would leave the project once the construction stage of the plant began—a stage that never occurred.

## **LES AND PLANT SITING**

LES' history is one of targeting rural, relatively poor communities that the company believes will not provide substantial opposition to its plans, or will prove powerless to effectively counteract its plans.

LES typically operates secretly, first surveying locations for appropriateness for a uranium enrichment plant (it must be located in areas of low seismicity, for example) and for availability of land. It then contacts local industrial development boosters and elected officials whom it perceives as sympathetic to its goals. If it receives a positive response, only then does LES publicly announce its plans.

In 1989, LES claimed to have searched for sites in several states within a 600-mile radius of the key uranium processing plant in Metropolis, Illinois—which provides the raw material for LES' operations, along with another plant in Ontario, Canada. But subsequent court documents and depositions made clear

that LES, which had sought and received the active backing of then-Senate Energy Committee Chairman J. Bennett Johnston, actively looked primarily at sites in northern Louisiana, Johnston's home state.

LES said it had narrowed its search to the land it purchased near Homer, LA because this was the best place in the country to site such a plant. As was revealed before an NRC Atomic Safety and Licensing Board, the site was chosen over another simply because the homes near one possible site were well-manicured and appeared prosperous, while the homes near the chosen site were smaller, in worse repair, and appeared much poorer.

These homes were the African-American communities of Center Springs and Forest Grove, and this testimony was a major reason why LES was found to have violated a Presidential order outlawing environmental racism.

LES may have thought these small, poor communities would prove incapable of stopping a major industrial project like a uranium enrichment plant, but people there formed a tenacious multi-racial organization called Citizens Against Nuclear Trash (CANT) and, over eight years, including 5 ½ years of legal hearings before the NRC's Atomic Safety and Licensing Board (ASLB, a judicial body), CANT firmly opposed LES. In the end, LES became the first, and only, entity ever denied a license by the NRC. Although LES won appeals of several of the ASLB decisions, including one challenging the company's finances and its plans for decommissioning and storage of the huge amounts of radioactive and hazardous waste it would generate, it finally gave up when it realized it was unlikely to prevail on the environmental justice issue.

CANT proved that local citizens organized in their own best interests, helped by national organizations like NIRS, Earthjustice, Greenpeace and others, can effectively protect their communities against even the largest nuclear corporations.

More recently, in August 2002, LES was considering locating in Unicoi County, in eastern Tennessee, near the existing Nuclear Fuel Services facility. But LES quickly changed its mind when community residents began weekly organizing meetings and held vocal protests against LES.

In September 2002, LES announced that it had narrowed its search to two possible sites, both near abandoned nuclear reactor construction sites owned by the Tennessee Valley Authority (TVA). One site is near Hartsville, Tennessee, in the central part of the state; the other in northern Alabama, at Bellefonte, near Scottsboro.

However, NIRS has learned (September 4, 2002) that elected officials and community leaders in the Scottsboro area have decided not to allow LES into their community, and have withdrawn their interest in the project.

There also have been stirrings of opposition in the Hartsville area, a poor rural county of about 8,000 people. Should LES not be welcome at this location, a new site selection process is likely, probably still focusing on the southeastern United States. The Wilmington, NC, Lynchburg, VA, and Columbia, SC areas all have been mentioned as possible LES sites, since they are near existing nuclear fuel fabrication plants.

## **LES AND JOBS**

LES targets small, relatively poor rural communities not only because it requires large, inexpensive land areas, but because it believes its biggest selling feature is jobs.

However, a closer examination reveals that there are few employment benefits to such communities from LES.

The biggest job impact from LES would be a relatively short (3 years or so) construction period. This would require about 400 jobs. In Louisiana, LES acknowledged that its job search area would cover 18 counties in three states—leaving people near Homer scant chance of obtaining a significant number of jobs.

On a permanent basis, an LES plant would require only 2-250 full-time employees. About 70 of these would be highly-skilled nuclear workers, which few rural communities can boast of having. People for these jobs, the highest-paying at an LES site, would be brought in from all over the U.S. and Europe, since there are relatively few people with expertise in LES technology.

The remainder of the 125-150 or so jobs would be primarily security guards, janitors, clerical personnel and routine maintenance workers. Because the LES centrifuge process is highly technical, and highly classified, there would be little chance for advancement for these workers.

An LES plant has, according to LES' own materials, a lifespan of 20-50 years. At that point, the plant must be decommissioned and its centrifuges completely dismantled (and likely melted) so as not to give away its classified technology. Thus, unlike some industrial enterprises which may last a century or more, LES is only a temporary facility, one which may leave behind much more than it contributes.

## **LES AND THE ENVIRONMENT**

The major effect an LES plant would have on the environment is the enormous amount of waste products it generates. This waste is composed of uranium hexafluoride (UF<sub>6</sub>), and is sometimes known as "depleted uranium." It is composed of uranium and hydrogen fluoride. It is mildly radioactive (but remains so for millions of years) and is also highly toxic and corrosive. The size plant LES wanted to build in Louisiana would have created about 200 14-ton canisters of this waste per year (some reports suggest LES now wants to build a plant twice that size).

Unfortunately, there is no place in the United States to put this toxic waste. Because of its high volume and low radioactivity, it is not treated as "high-level" nuclear waste. Because of its extremely long hazardous life, it is not eligible to be disposed of as "low-level" nuclear waste, which has only a 500-year oversight period. And because of its huge volume, it is not treated as the mixed radioactive/hazardous waste that it is—costs for disposal of such material (some \$15,000 per cubic foot) would be prohibitive.

The U.S already has some 450,000 tons (nearly 1 Billion pounds!) of UF<sub>6</sub> waste piled up at existing or closed uranium enrichment plants at Oak Ridge, TN; Paducah, KY; and Portsmouth, OH. While there is a small market for this material to create armor-piercing ammunition and ballasts for some planes and ships, these increasingly controversial uses of the material do not even make a dent in the backlog. Thus, the UF<sub>6</sub> waste LES would create likely would remain onsite indefinitely.

Any uranium enrichment plant such as the one proposed by LES also has other effects on the environment. Air and water emissions of radioactive and hazardous materials are generally small during normal operations, but not non-existent. And while LES under normal operations likely would comply with federal annual emissions guidelines, these regulations fail to take into account the long-lived nature of the radioactive uranium which LES enriches. For example, in the Louisiana case, LES water emissions would have gone into a small holding pond onsite. However, this pond fed into a stream, which fed into a nearby man-made lake, created for recreational and, ultimately, drinking water. While its annual emissions would have been within the federal guidelines, the cumulative effect of such emissions could have prevented the lake from meeting Safe Drinking Water standards.

## **THE NUCLEAR FUEL CHAIN**

At this point, it may be helpful to understand the nuclear fuel chain, and the unique properties of Uranium Hexafluoride.

Uranium enrichment is one of several steps required to create fuel for nuclear power reactors, as well as atomic weapons.

First, uranium must be mined, much like coal. This raw material is then taken to a facility to be milled, or ground into "yellowcake." This yellowcake is then transported to another facility, where it is processed into a gaseous form of uranium hexafluoride (UF<sub>6</sub>). This is cooled into a solid, and then transported to a uranium enrichment facility—the proposed LES plant—where the UF<sub>6</sub> is again turned into a gas, and the uranium is brought from a concentration of less than 1% to about 5%, in a much smaller body of material (for nuclear weapons, it is brought to an 80-90% concentration, which is known as highly-enriched uranium).

This enriched uranium is sent to a fuel fabrication facility, where it is turned into small pellets placed into long fuel rods for use in commercial nuclear reactors. The waste material at the uranium enrichment plant is nearly 100% of the original UF<sub>6</sub>, less some of the uranium, which has been essentially "siphoned off" to be sent to the fuel fabrication factory.

The fuel rods are then shipped to the nuclear reactors, where they are used for 12-18 months, and then removed as "high-level" nuclear waste—perhaps the most lethal substance known to mankind.

## **URANIUM HEXAFLUORIDE**

This is the raw ingredient used at a uranium enrichment facility, and is also the waste product from the facility. It is mildly radioactive and highly toxic and corrosive.

When transported and stored, it is normally in a solid state; during the enrichment process, it is converted into a gas. It is most dangerous in a gaseous state, which comes about in the plant through spinning it through thousands of highly-calibrated centrifuges, but can also accidentally occur through exposure to heat. To place it in cylinders for transportation and/or waste storage, it must be in a gaseous form, which poses risks to plant workers and nearby residents.

In 1985, an accident at the Sequoyah Nuclear Fuels facility in Oklahoma killed one person and injured several others due to their exposure to gaseous UF<sub>6</sub>.

According to the National Institute for Occupational Safety and Health, people should "avoid all contact!" with UF<sub>6</sub>. The material "decomposes on heating producing toxic fumes of hydrogen fluoride....reacts violently with water and ethanol....attacks many metals forming flammable/explosive gas....attacks plastic, rubber and coatings." NIOSH adds, "exposure at low level may result in death."

Fire at a UF<sub>6</sub> storage site, such as would exist at an LES plant, is a major concern for public safety and health, since a fire would turn the material into a gaseous form, could explode corroded storage cylinders, and it cannot be put out with traditional firefighting means such as water—that would only make matters worse.

## **LES AND TRANSPORTATION**

When one recognizes how many cylinders of radioactive/hazardous UF<sub>6</sub> waste an LES plant would produce, one can understand that an equal amount of this material would be shipped into an LES facility—some 200-400 14-ton cylinders per year, or at least one every workday, perhaps more.

The sites LES has chosen, both in Louisiana and more recently in Tennessee and Alabama, are accessible only by secondary roads, normally two-lane roads not usually thought of as appropriate for transport of large amounts of hazardous material.

Such roads increase the chances of accident, yet LES so far has not indicated a willingness to pay for major road improvements, which might benefit a community in other ways as well.

A traffic accident that caused a fire would be of most concern, since such an accident could cause release of UF<sub>6</sub> in its gaseous form, endangering nearby residents. Such an accident could occur with, for example, another truck carrying gasoline or other flammable material, or even with a passenger car traveling at a high rate of speed.

## **LES AND ACCIDENTS**

It is difficult, but not impossible, to postulate a serious accident at the LES facility during normal operation. Most likely, an accident would occur when emptying or filling a cylinder, when the UF<sub>6</sub> is in a gaseous form. Such an accident could cause a release of this gas, endangering the health and lives of nearby residents. While communities can argue that emergency planning measures and adequate medical and other emergency response facilities be in place, the NRC does not require such precautions for licensing of an LES-type plant.

Other accidents could occur by fire, floods, or other natural disasters.

## **LES AND SECURITY**

An LES uranium enrichment plant poses a national security risk on several levels.

First is the obvious potential for such a plant to be a target for terrorists or other enemies.

A successful terrorist attack on a uranium enrichment plant, especially one that has accumulated a substantial inventory of UF<sub>6</sub> casks, could result in the release of a large amount of UF<sub>6</sub> into the local region. Further, it could damage the enrichment facility itself, causing disruption of fuel supplies to nuclear reactors, and, depending on the function of the plant, to nuclear weapons.

Transport of UF<sub>6</sub> to and from the uranium enrichment plant could provide terrorists with a ready-made "dirty bomb," a target that would provide significant local damage if successfully breached, as well as wider-spread panic and fear.

## **LES AND NUCLEAR PROLIFERATION**

Urenco, the lead partner in LES, has a poor record in preventing its highly-classified centrifuge enrichment process from falling into the wrong hands.

Indeed, Pakistan's successful nuclear weapons program owes much to Urenco—a Pakistani engineer infiltrated Urenco and apparently stole the company's blueprints, enabling that country to produce its own enriched uranium for use in its atomic weapons.

More recently, concern over Iraq's potential nuclear capability stems primarily from the revelation that Iraq in the early 1990s was found to be attempting to build uranium enrichment centrifuges based on Urenco designs. It is not known how Iraq obtained this information. The U.S. House of Representatives has held hearings on this issue, and the *Baton Rouge Advocate* newspaper ran an excellent series explaining this little-known aspect of Urenco's record.

Approval of a Urenco uranium enrichment facility could damage U.S. efforts to encourage the destruction of nuclear weapons owned by Russia. Currently, a program exists where highly-enriched uranium from the dismantlement of Russian nuclear weapons is "downblended" in order to create nuclear reactor fuel. This process is overseen by the U.S. Enrichment Corporation (USEC), a private company that has taken title to former Department of Energy enrichment properties. USEC is seeking approval to build its own centrifuge enrichment plant, to replace its older, existing plants. It is unlikely, as a foreign-dominated entity, that LES could obtain U.S. government approval to participate in this program to reduce the threat of Russian nuclear weapons.

This factsheet touches on some of the many controversial issues surrounding LES, Urenco, and uranium enrichment generally. It does not cover such key issues as whether a new uranium enrichment plant is even needed, nor whether the involvement of utilities such as Exelon, Entergy and Duke Power means that these companies seek to build new atomic reactors in the U.S.—indeed, Exelon and Entergy have both publicly expressed interest in doing so—which would resurrect a nuclear era that effectively ended in the 1970s.

--*Michael Mariotte, Nuclear Information and Resource Service, September 9, 2002*

## RESOURCES

**WISE-Uranium.** This website contains massive documentation and information about the entire nuclear fuel cycle, the hazards of UF<sub>6</sub> and links to government and other sources of information. [www.antenna.nl/wise/uranium/index.html](http://www.antenna.nl/wise/uranium/index.html)

**ValleyBeautiful.** [www.valleybeautiful.org](http://www.valleybeautiful.org) This website, put up by citizens of Unicoi County, TN, is a good place for the most current information about LES. Citizens in Unicoi County chased LES away based just on rumors LES might locate there.

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This international organization assists local communities in fighting unnecessary and dangerous nuclear projects. NIRS played a major role in stopping the LES proposal to build a uranium enrichment plant in Louisiana.