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RE: Docket ID NRC-2018-0052; Holtec International's HI-STORE CIS Facility for Spent Nuclear Fuel, Lea County, New Mexico

**Comments by the Rio Grande Foundation  
on Holtec International's HI-STORE CIS Facility for Spent Fuel**

**Introduction**

The Rio Grande Foundation is pleased to submit its comments regarding the NRC's review of Holtec International's application to build and operate a Consolidated Interim Storage (CIS) facility for up to 100,000 tonnes of spent nuclear fuel (SNF) in Lea County, New Mexico.

If built, the company's facility will pose no significant risk to public health and safety, and will not offer terrorists a tempting target. In addition, Holtec's project is attractive for the savings it is likely to bring to both taxpayers and ratepayers. But as New Mexico's free-market think tank, the bulk of our comments will focus on how projects like Holtec's have the potential to fundamentally alter the nation's expensive and failure-ridden SNF policy.

With a long history of participation in the nuclear industry, the Land of Enchantment is well-positioned to play a role in what could be a cheaper, more flexible, and ultimately wealth-producing shift toward privatized, competitive stewardship of SNF. It's an approach that the federal government should have pursued in the 1980s. Nearly four decades, and billions of dollars, have been squandered on the Yucca Mountain "solution," yet the nation is no closer to resolving its SNF problem. With politicians in Washington looking to resume work at Yucca

Mountain,<sup>1</sup> it is essential that the NRC approve Holtec's plan -- and thus, begin to demonstrate that there is an alternative to Washington's one-size-fails-all approach.

### **Protecting People and Wildlife**

The Foundation has closely scrutinized the documents filed by Holtec in support of NRC approval for its facility, and we see neither public-safety nor environmental-protection showstoppers. Indeed, so far, many of the objections raised by commenters who have submitted "their" opinions appear to be cut-and-pasted from talking points provided by professional antinuclear and eco-alarmist organizations, including "Beyond Nuclear" and "Nuclear Watch New Mexico."<sup>2</sup> Such hysterical claims -- e.g., unacceptable risks during transit, the potential for terrorist attacks, and "environmental racism" -- are wholly without merit, and deserve no serious consideration from the commission.

To address three issues specifically:

*Transportation:* Contrary to the popular image of nuclear "waste" as a green, gooey, dripping, glowing substance, SNF is "a solid, ceramic metal that cannot drain out of its container."<sup>3</sup> Its movement on America's roads and rails has an essentially unblemished safety record. The same is true throughout the planet. As the World Nuclear Association has noted, globally, high-level waste has been transported *tens of thousands* of times, with shipments being "executed virtually without incident and without any harmful radioactivity releases."<sup>4</sup>

A 2007 analysis by The National Academy of Sciences found "no fundamental technical barriers to the safe transport of spent nuclear fuel and high-level radioactive waste in the United States. When conducted in strict adherence to existing regulations, such transport is a low radiological risk activity with manageable safety, health, and environmental consequences."<sup>5</sup>

Liberal novelist/journalist Gwyneth Cravens, a native New Mexican, explained the substantial shielding mandated to protect humans and the environment from SNF:

Spent-fuel assemblies [are] hauled from nuclear plants by rail or truck ... using vehicles and containers that meet NRC and Department of Transportation regulations. The shell of a nuclear waste cask is fifteen times thicker than that of a gasoline tank truck; it must have three inches of stainless steel as well as thick radiation shields. Nothing can escape the double-shelled, impact-resistant steel casks, even in the worst collision. Furthermore, the transportation specialist hired by the State of Nevada to highlight problems acknowledges that these casks "are among the best containers that humans know how to make to contain hazardous materials."<sup>6</sup>

An essay written by 19 members of the National Academy of Engineering concurred:

Extensive analysis, backed by full-scale field tests, show that there is virtually nothing one could do to these shipping casks that would cause a significant public hazard. Before

shipment, the fuel elements have been cooled for several years, so the decay heat and the short-lived radioactivity have died down. They cannot explode, and there is no liquid radioactivity to leak out. They are nearly indestructible, having been tested against collisions, explosives, fire, and water.<sup>7</sup>

*Environmental Protection:* Holtec is proposing to cite its facility in a remote, lightly populated, extremely dry, and seismically stable portion of the American Southwest. Wildlife in the region is scarce, and the three federally listed species in Lea County are unlikely to be adversely affected by a facility that, at full build-out, would encompass merely 330 acres -- in a county that contains more than 2.8 million acres.

Hurricanes and tornadoes are basically nonissues at the location, and the CIS will have negligible impact on air quality. No historical buildings will be destroyed, and no significant cultural/archeological sites disturbed. No potable groundwater is found on the property.

During construction and operation, the CIS will be subject to a vast array of state and federal laws and regulations which cover, among other things, air emissions, road-building, endangered species, water discharges, hazardous-waste generation, and "noise pollution." There is every reason to believe that Holtec will be a good neighbor regarding environmental issues.

*Security:* Given the facts about shipping casks described previously, terrorists are extremely unlikely to attempt to hijack or damage SNF headed for Holtec's facility. And once the fuel assemblies arrive, they will not offer tempting targets. In addition to the deterrent of on-site, armed security and zero potential to inflict harm on a large number of victims, Holtec's HI-STORM UMAX system

stores the canister containing SNF entirely below-ground to serve as a 'security-friendly' storage facility, providing a clear, unobstructed view of the entire CIS Facility from any location and the closure lid is a massive steel weldment filled with concrete, virtually eliminating the storage contents as a target for malevolent acts.<sup>8</sup>

Since 9/11, terrorists in America and Europe have committed their atrocities against "soft targets" in heavily populated areas, using easily obtained or assembled weapons such as guns and bombs. (And occasionally, weaponized vehicles.) Stealing SNF from, and/or attacking Holtec's CIS would require capabilities and demonstrate preferences that terrorists do not have.

### **The Need for Change**

It is clear that Holtec's proposed CIS poses negligible risks to people, wildlife, and the environment. But an equally compelling reason for the Rio Grande Foundation's support is the way that the company, as well as its competitors, can fundamentally change the nation's management of SNF.

Consolidated storage of SNF, administered by firms seeking not to please elected officials, but return value to shareholders, represents a profound shift away from politics and central planning -- and toward a market-oriented process that taps the power of competition and the profit motive.

In 1987, frustrated with decades of incoherence and indecision over national SNF disposal, Congress amended the Nuclear Waste Policy Act (NWPA), which it had enacted five years earlier. Politicians required a new, narrow, and quite risky strategy: the U.S. Department of Energy would study Nevada's Yucca Mountain, located approximately 100 miles northwest of Las Vegas, *alone* as the location for a permanent repository. Despite the existence of attractive alternatives -- a list that even included disposal in a clay sea bed 600 miles north of Hawaii -- Congress's decision "tied the entire US high-level waste management programme to the fate of Yucca Mountain site."<sup>9</sup>

Dr. Rip Anderson, a scientist now retired from Sandia National Laboratories, succinctly summarized the weakness of the Nuclear Waste Policy Act Amendments Act of 1987, calling it

mainly political. It was subjectivity, not science. Yucca Mountain wasn't chosen totally on its scientific merit. It was a political compromise. The government owned the land, it was already contaminated from nuclear tests, and there was already a lot of scientific information about the land available. With Yucca Mountain, you have very complicated geology that's difficult to understand. Later, when work to characterize the site began, infighting began among several national labs as to how to do the science for something that would be used for ten thousand years.<sup>10</sup>

A challenging geological formation to analyze, bureaucratic turf battles, revenue/funding disputes on Capitol Hill, and rabid resistance from Nevada's state- and federal-level politicians combined to make Yucca Mountain site characterization classic federal "Big Tech": over \$15 billion<sup>11</sup> squandered on a failed project whose justification, operation, and ultimate fate were determined more by public opinion, elections, lobbying, and litigation than science, engineering, economics, and the national interest. The Space Transportation System (space shuttle), B-1 (bomber), Clinch River Breeder Reactor, Supersonic Commercial Aircraft Development Program, Synthetic Fuels Corporation, Superconducting Super Collider, B-2 (bomber), National Aerospace Plane, F-22 (fighter), Evolved Expendable Launch Vehicle, Partnership for a New Generation of Vehicles, V-22 (military aircraft), RAH-66 (military helicopter), International Space Station, Expeditionary Fighting Vehicle, X-33 (prototype space-shuttle replacement), F-35 (fighter), National Polar-orbiting Operational Environmental Satellite System, Littoral Combat Ship, Future Combat Systems, *Ford*-class aircraft carrier, Space Launch System and Orion Multi-Purpose Crew Vehicle, Mixed Oxide Fuel Fabrication Facility, James Webb Space Telescope, FutureGen (coal plant with carbon capture and sequestration), Chemistry and Metallurgy Research Building Replacement Project, Airborne Laser, DDG 1000 (destroyer), National Ignition Facility (fusion research) -- the federal government has exhibited an almost complete inability to competently manage challenging, complex, multi-decadal technical undertakings.<sup>12</sup> Yucca Mountain proved to be just one more addition to the list. The

DOE did not begin to dispose of the nation's SNF by the congressionally mandated deadline of January 31, 1998 -- at Yucca Mountain, or anywhere else.

The nation's SNF problem intensified when the owners of nuclear reactors -- all of which signed contracts with the DOE for disposal -- sought relief in the courts. Nearly two decades of litigation brought an end to the fee, imposed on nuclear-electricity generation in the 1980s, that was designed to pay for a permanent geological repository. (In 2014, when the DOE stopped collecting the 0.1 cent-per-kilowatt-hour charge, one congressman celebrated the end of an "annual theft of \$750 million from electricity consumers."<sup>13</sup>)

But while ratepayers received relief, taxpayers did not. Washington's Judgment Fund, "established to pay court judgments and Justice Department compromise settlements of actual or imminent lawsuits against the government,"<sup>14</sup> has paid out billions of dollars to cover the expenses of entities with no choice but to continue to store SNF on-site.<sup>15</sup>

Politics further complicated matters when the Obama White House decided to suspend the federal government's attempt to obtain NRC permission to build and operate the repository. In 2010, the administration withdraw the DOE's license application, submitted two years earlier under President George W. Bush. Today, the licensing process, which predictably made its way to court, remains in limbo. The Trump administration is attempting to secure \$120 million for the DOE and \$47 million for the NRC to resume licensing work in the 2019 fiscal year.<sup>16</sup> And just a few weeks ago, the U.S. House of Representatives voted, 340-72, to approve "a bill that would revive the licensing process on the Department of Energy's application to open Yucca Mountain."<sup>17</sup> U.S. Senator Catherine Cortez Masto (D-NV) and U.S. Sen. Charles Schumer (D-NY), who serves as the chamber's minority leader, left no ambiguity about their opposition to the legislation: "The House bill to revive Yucca Mountain is dead on arrival. Yucca is a massive waste of taxpayer dollars to the tune of \$15 billion. Now, the House has voted to waste another \$82 billion. We will continue to make sure that any effort to restart this project fails."<sup>18</sup>

With America's SNF policy, the more things change, the more they stay the same. In 2012, former U.S. Rep. Lee Hamilton (D-IN), a co-chairman of the Blue Ribbon Commission on America's Nuclear Future, told Congress:

Our view is we've had 30 to 40 years' experience, and as a country we have not been able to reach a solution. You can blame whoever you want. I suspect there is blame to go around. The fact is, the process we have been following has not worked for whatever reason, and it continues to roll up huge costs to the American taxpayer. If you stand around and insist on Yucca, Yucca, Yucca, which people have been insisting on for a long, long time but have not been able to pull it off, we think the result of that is an impasse.<sup>19</sup>

It is time for something different -- and Holtec's proposed CIS facility can play a major role in a complete overhaul of national SNF policy.

## A Final Transition from Technocracy

Political scientist Robert J. Duffy observed that “the nuclear power industry is ... the product of an unprecedented partnership between the federal government and private enterprise, and the industry owes its existence to decades of federal support and protection.”<sup>20</sup> Bruce L. Welch, writing in the far-left *The Nation*, called nuclear power “wholly and completely a product of government design, promotion and subsidy.”<sup>21</sup> The libertarian Cato Institute agrees: “In the final analysis, the nuclear industry is purely a creature of government.”<sup>22</sup>

But in the post-Cold War era, atomic energy in America moved away from D.C. paternalism and state-sanctioned monopoly. The withdrawal of most federal subsidies, and the adoption of electricity choice in many jurisdictions, did not destroy the industry, as many predicted. Nuclear power survived, and in the 1990s, it began to thrive. Writer William Tucker described the culture change: “Basically, nuclear power escaped the claustrophobic environment of regulated utilities and federal bureaucracy and entered the private sector. More than one quarter of the nation’s ... reactors are now ‘merchant’ plants -- owned by the new independent energy companies rather than the regulated utilities of yore.”<sup>23</sup>

The transformation did not induce a decline in safety. Between 1997 and 2017, the industry’s already-improving safety rate -- measured as the number “of accidents resulting in lost work, restricted work, or fatalities per 200,000 worker hours” -- rose by a factor of *ten*.<sup>24</sup> During the same period, productivity soared. Average capacity factor for U.S. nuclear reactors grew from 70 percent to *93 percent*.<sup>25</sup>

With tight competition from combined-cycle plants burning natural gas, the future of atomic energy, which currently produces a fifth of the nation’s electricity, is anyone’s guess. But there is no doubt that the industry has transitioned away from public-sector coddling, and performed impressively in a more market-oriented environment. There is one task left for nuclear power to make a complete transition away from technocracy, though: It must take out its “trash.”

As the Heritage Foundation has noted:

[R]esponsibility for nuclear waste management ought to belong with nuclear power operators as an aspect of producing commercial power, in the same way that other industries, such as health care, mining, farming, or manufacturing, are responsible for managing their own wastes. If waste management were a dynamic part of a utility’s bottom line, the nuclear industry would naturally be interested not only in efficient nuclear waste disposal, but also in cost-effective pre-disposal choices, such as interim storage options, fuel types, and reactor technology.<sup>26</sup>

By now, it should be clear to all parties that expecting the federal government to resolve the SNF quandary is foolish. The nuclear industry should push for legislation to empower it to pursue its own solution(s) -- subject, of course, to the NRC’s health, safety, and environmental oversight.

Not every dollar set aside to establish the Yucca Mountain repository has been wasted. Far from it. At the end of the 2016 fiscal year, the Nuclear Waste Fund, established to “manage and dispose of” America’s SNF, had a balance of nearly *\$40 billion*.<sup>27</sup> Such an enormous sum could cover a wide varieties of management strategies in the short-, intermediate-, and even long-term timeframes.

The most obvious current option is consolidated storage at CIS facilities like the one Holtec seeks to build. It’s an approach the Blue Ribbon Commission on America’s Nuclear Future recommended, in its 2012 final report:

One or more consolidated storage facilities should be established, independent of the schedule for opening a repository. The [Nuclear Waste Policy] Act should be modified to allow for a consent-based process to site, license, and construct multiple storage facilities with adequate capacity when needed and to clarify that nuclear waste fee payments can be used for this purpose.<sup>28</sup>

Multiple CIS facilities, employing NRC-certified technology and industry best practices, would buy time -- perhaps as much as a century or more -- to find a permanent solution, or solutions, to SNF. In a rule adopted by the NRC in 2014, the commission assumed “replacement of dry casks after 100 years of service life, even though studies and experience to date do not preclude a longer service life.”<sup>29</sup> No one knows the precise length of time, but there is little doubt that CIS infrastructure is capable of safely storing SNF far into the future. (Given the federal government’s Yucca Mountain debacle and the robust nature of its HI-STORM UMAX system, it is hardly surprising that Holtec is considering “an extended operating lifetime of 120 years” for its New Mexico facility.<sup>30</sup>)

Choice, competition, the profit motive. A SNF policy that makes use of these tools is a way to “let a thousand solutions bloom” for SNF. These possibilities include:

*Reprocessing:* The “once-through” process -- in which nuclear fuel is not recycled -- is not practiced by every nuclear nation. In Europe and Asia, SNF is reprocessed through a chemical procedure that separates usable uranium and plutonium from fission products such as strontium-90 and cesium-137. The fissile material is then placed right back in reactors, to generate electricity once again.

Storing SNF, according to one critic, is “a prodigal waste of valuable nuclear fuel and a long-term maintenance problem that the nation doesn’t need.”<sup>31</sup> Another reprocessing supporter noted that when “spent fuel is recycled, the required isolation time for the true waste is reduced to less than 500 years. In addition, one is able to obtain more than 99 percent of the energy in the original uranium ore compared with less than 1 percent with the current wasteful once-through cycle.”<sup>32</sup>

Reprocessing does not take place in America for two reasons. In the 1970s, concerns (largely unfounded) about nuclear proliferation and terrorism prompted the Ford and Carter

administrations to ban the practice. While the proscription was later lifted by the Regan administration, the availability of cheap “fresh” uranium, as well as the cost and complexity of reprocessing, rendered it undesirable. But economics change, and technologies advance. Reprocessing may not make sense in America today, but there is no reason to believe that eschewing the practice will always make sense. In time, what is now “waste” may be seen as a commodity with a value in the marketplace.

*Transmutation:* A 1996 National Academy analysis explored the separation of “hazardous long-lived radioactive nuclides” in SNF and the transformation of “them by neutron bombardment to form nuclides that would be either stable or radioactive with a much shorter half-life.”<sup>33</sup>

Transmutation remains unachievable now, but again, a century is a long time. A decade and a half ago, a UK scientist surmised that the “transmutation process offers very good prospects of dealing with [SNF] in an environmentally safe way. It has the potential to transform the future of nuclear power generation.”<sup>34</sup> His vision may yet become reality.

*Solar or Lunar Disposal:* While it seems farfetched today, the possibility of sending SNF to a fiery death in the sun’s core or permanent isolation on the moon may not be outlandish in decades to come. Driven by SpaceX and other “NewSpace” ventures, the reusability revolution is causing launch costs to fall. Off-planet SNF disposal could one day be an option.

*CIS as Permanent Storage:* Ultimately, none of the possibilities above may prove viable for the permanent closure of the nuclear fuel cycle in the United States, and no other approaches/technologies/markets may develop that deliver much hope. In that case, turning CIS facilities into permanent storage may prove desirable. A long record of safety, the production of a steady stream of local and state tax revenue, and employment opportunities could prompt host communities to enthusiastically accept a transition from interim to permanent storage.

At first glance, returning all Nuclear Waste Fund monies to the original producers of SNF, and empowering them to pursue their own solutions, may appear too simplistic -- or too naïve -- to work. But would such a reform be riskier than hoping, against all experience, that federal politicians and bureaucrats will one day rise to the challenge? For decades, the nuclear industry has counted on Washington to solve the SNF problem. Its faith was misplaced. All supporters of atomic energy should concede that federal technocracy has failed ratepayers and taxpayers. A new approach, founded on the transformative power of property rights, competition, and private-sector accountability, promises a better path.

## **Conclusion**

Holtec’s CIS facility will be safe, it will almost certainly result in savings to taxpayers, and it could well play a major role in the shift away from the nation’s costly and spectacularly unsuccessful attempt to build and operate a SNF facility at Yucca Mountain. The Rio Grande Foundation urges the commission to conclude its review with a favorable finding for Holtec. The United States cannot squander another four decades, or more, on a single, permanent,



geologic repository. CIS offers a better way, and perhaps even a path to a permanent solution for the nation's SNF challenge.

## Notes

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