

Re: King Tut's Nukes (back by popular demand)

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From: Karl Johanson (karljohanson_at_shaw.ca)

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"Tim O'Flaherty" <bigbrador@verizon.net> wrote in message
news:uOIPc.4314\$Qm.1583@trndny01...
>
> "Karl Johanson" <karljohanson@shaw.ca> wrote in message
> news:cJAPc.156677\$Mr4.43293@pd7tw1no...
> > "Tim O'Flaherty" <bigbrador@verizon.net> wrote in message
> > news:5LaPc.2057\$7k6.462@trndny05...
> > > In the year 2000, the US produced roughly 20% of it's electric
> > power
> > > with nuclear reactors. This amounted to about 8 quads (quadrillion
> > BTU's)
> > > out of a total of 100 quads total energy consumption. So we have
about
> > 8%
> > > of our total energy coming from nukes in 2000. If we accept the
notion
> > > that nuclear is the answer to our future energy needs since it hasn't
> > the
> > > problems associated with fossil fuels, CO2 and diminishing resources
and
> > if
> > > we assume (very conservatively I might add) that US energy
consumption
> > > remains flat, we require a sixteenfold increase in nuclear generating
> > > capacity.
> >
> > 16 times 8 is 128, not 100. I think you meant, "... we require a twelve
> > and
> > a half fold increase in nuclear generating capacity."
> >
> > >
>
> Damn it! Karl you're right again. This is embarassing.

The only time one should be embarrassed by mistakes is when one refuses to learn from them.

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- > *Haste makes waste.*
- > *I'm out of practice but that's no excuse for egregious errors such as this.*
- > *I'll never make it through GC's post if I keep going at this rate.*
- >
- > *King Tut reigned some 3300 years ago. Let's assume this was*
- > > *the beginning of the nuclear age.*
- > > *We have generated enough waste in a half century to fill Yucca*
- mountain.
- > >
- > > *Fill? The amount of spent nuclear fuel to be stored at Yucca was set to*
- a
- > > *specific amount for political reasons.*
- >
- > *People disagree. Politics is a mechanism by which we attempt to*
- make
- > *good decisions.*

I agree. The volume of waste was set at a number to be studied. The studies show that there's room for lots more.

- > *There are disagreements on this topic and of course the*
- > *results of this decision will be so far reaching it is important to get it*
- > *right. It's also important to note that all those who opposes Yucca or*
- > *nuclear expansion aren't the sort to mistake an eight for a sixth. There*
- > *are good minds on both sides of this issue.*
- > *Deciding to build nukes in the first place was also a political*
- > *decision.*

Yes.

- > *When the first bomb was tested there were still lingering doubts*
- > *as to whether the test would set off a much larger reaction chain that*
- would
- > *consume the planet.*

And concerns that it would ignite the atmosphere., which it did. Quite a bit of nitrogen oxidized, but it didn't spread around the planet.

- > *They had done the math but humans sometimes err eh?*

Yes, and some (like you above) admit them & learn from them.

- > *We can argue about whether it was justified or not but that's history.*

(And quite a different topic.)

- > *Using*
- > > *above ground storage for 50 years, to allow more of the fission products*
- &
- > > *Transuranics to decay, and adding solid state thermal conductors, could*
- > > *probably*

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- >
- > *Leaving aside the security risks, we are already dipping into the realm of*
- > *"probably".....*

While there's not much 'probably' about the millions killed every year due to renewable energy.

- >> *allow you to multiply the amount stored there by a factor of one*
- > > *hundred or more. But lets assume only twice as much, to be conservative.*
- >
- > > *The US's spent nuclear fuel hasn't hurt anyone sitting on the surface in*
- > > *pools of water (even as some of it is fresh out of the reactor).*
- >
- > *Some misguided people may have plans to change that.*

If you're referring to the possibility of terrorist attacks of above ground pools; I'd rather they attack such targets than any number of other energy related targets, which could cause considerably more deaths for less effort. I note a group of people using nothing more sophisticated than dynamite, breached a dam in China in 1938 and killed an estimated 900,000 people. A non-intentional cascade failure of dams in China in 1975 killed around 86,000 people outright and another 145,000 died soon after due to disease and starvation (a hydraulic engineer I spoke with from China says that they refer to this incident as "75.8"). Some natural gas tankers could release close to 2 megatons of energy if ignited. So again, I'd rather someone try to attack spent fuel, inside a steel reinforced concrete building, in a pool of water, instead.

- > *I don't*
- > > *know why all the hubbub about having 10 year old or older spent fuel in*
- > > *multilayered containers, surrounded by bentonite clay, in solid rock*
- > > *(especially as there's no hubbub about 'renewable' geothermal energy*
- > *plants*
- > > *in California emitting up to 5 trillion picocuries of radiation (along*
- > *with*
- > > *a host of chemical toxins) into the environment every day).*
- >
- > *I wasn't aware of a threat from geothermal plants. I think you are*
- trolling
- > *with less than live bait here.*

Because you haven't heard of something, doesn't mean it isn't true. Asking for references is acceptable.

"Health Physics Journal", May 1990

I didn't say it was a threat (you're the radiophobe, not me). I said it was up to 5 trillion picocuries every day. I think it's either trivial, harmless or hormetic. I merely list in in comparison to the more trivial releases from nuclear plants, and the similarly trivial releases which might, maybe come out of Yucca 10,000 years hence. I've sat in geothermally heated pools at Banff, Ainsworth and the aptly named Radium Hotsprings (and I hope to go

to Hot Springs Cove near Tofino soon). I knew they all exposed me to considerably higher radiation doses than I'd get from sitting next to a nuclear power plant, but wasn't concerned.

You might also want to check out Scientific American's article on geothermal energy in California being suspected of causing hundreds of earthquakes (up to force 5).

<http://www.sciam.com/article.cfm?articleID=00011EB0-E249-1CF4-93F6809EC588000&sc=I100322> (Or www.sciam.com , search on 'geothermal', then go to the article, "California Heats Up over Natural Steam".

> *But to comment*

> > *on some of your numbers...*

> >

> > > *So*

> > > *33 centuries will have required $66 \times 16 = 1056$ Yucca Mountains.*

> *Assuming*

> > > *(again very conservatively I believe) that decommissioning of these*

> *storage*

> > > *facilities can take place after 10k years we will have over three*

> *thousand*

> > > *of these to maintain and guard by time we are ready to close the first*

> *one*

> > > *down.*

> >

> > *(Some rounding used in the following estimates.)*

> >

> > *So, assuming 3 times the 33.3 odd centuries, the number adds to around*

> > *3,168.*

> >

> > *-If we correct the 16 to 12.5, then it would be $12.5 \times 66 \times 3 = 2,475$*

(see

> > *how many we've saved already?)*

> >

> > *-If we assume only twice as much fuel stored per Yucca, we're down to*

> > *1,238.*

>

> *I feel so much better.*

> > *-Average fuel burn-up for US reactors is going up. It used to be around 25*

> > *MegaWatt Days per Kilogram of fuel. Now it's averaging around twice that,*

> > *which cuts the spent fuel volume per MegaWatt Day in half. Now we're down*

> > *to*

> > *619 Yuccas. Fuel burn-ups of 60MWD / Kg are common in some reactors now*

> > *(which brings us to around 516 Yuccas).*

>

> *"All of the country's nuclear power plants together produce about 2,000*

> *metric tons of used fuel annually."*

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> <http://www.nei.org/index.asp?catnum=2&catid=62>

>

> *Are you seriously suggesting the real number is now only half that?*

It's around half, per watt hour (or per MegaWatt Day, if you prefer), than what it was when burn ups were half as high.

> *<snip more pie in the sky projections>*

Yes, how foolish of me to assume technological advancements over a period of 10,000 years...

> > **The more people protest Yucca mountain, the more likely it is that the*

> > *existing spent fuel will be reprocessed.*

> >

> > *The UN estimates that 'renewable' biomass energy emissions are killing*

> > *around 2.5 million people, every year (that's somewhere around 42.5*

> > *million*

> > *since Chernobyl). Even some of the inflated death toll estimates for*

> > *Chernobyl (the worst nuclear accident & likely the worst possible), are*

> > *less*

> > *than renewable energy's daily death toll.*

>

> *That's terrible Karl.*

Yes it is. Well said sir.

> *Perhaps we need to ban the burning of firewood.*

Or adopt a sense of proportion about energy safety issues. Worrying about a possible >1% radiation increase in the ground water around Yucca 10,000 years from now, or worrying about 6,850 deaths per day now due to biomass energy (which is emitting radio-isotopes into the atmosphere now)...

I don't begrudge people gathering up wood, manure and straw to cook their food & boil their water. I do begrudge full bellied folks casually yakking on an internet (which gets a substantial percentage of it's energy from nuclear) begrudging such folks similar access to nuclear energy, electric stoves & desalinated sea water*.

Other ways to help include, increasing access to better cookstoves, which use far less biomass & which produce considerably less smoke. Increase access to solar water sterilizers (one useful technique is to leave marginal water in a clear plastic bottle in the sun for a few days).

Karl Johanson

*If one is currently drinking ground water, drinking desalinated seawater instead could reduce one's radiation exposure (from dissolved radon & its daughter isotopes). Living right next door to tens of thousands of nuclear plants might boost ones dose enough to make up for the decreased dose from

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the drinking water. The nuclear plants won't do anything to make up for the lack of Arsenic (common in some groundwater).