The Effects On The World From Nuclear Energy

Introduction:

For our engineering project my group has been assigned the topic of ‘Nuclear Energy’. Within my group we have split this topic into sub headings which we each have been assigned one, these headings are , A: How it works, B: Effects on the world, C: Future of nuclear energy and D: The history of nuclear energy. The topic which I have been assigned is topic B: Effects on the world. The aim of our project is to investigate each of our headings in depth and gain as much knowledge as possible about nuclear energy while carrying out our project and to be able to apply this knowledge gained in the future.

Effects on the world of a nuclear meltdown:

When creating nuclear energy there is always the risk of a nuclear meltdown due to extreme temperatures during the process. When a meltdown occurs, there are large amounts of harmful substances released into the environment.

Water is heavily relied on in order to cool down the uranium core which reaches extreme levels of heat, it is cooled by being submerged in water that is constantly being flowed through the system. In the case of an electrical power cut this will result in a loss a power to the water pumps resulting in them stopping the flow of water through the system, when this occurs the uranium core cannot be sufficiently cooled, the uranium keeps rising in heat and then once it hits 5000 degrees it can explode releasing radioactive particles into the atmosphere, this is known as a meltdown.

When a meltdown occurs and the core explodes there are massive amounts of radioactive nuclear waste that are released into the atmosphere that can cause great effects to the wildlife, humans and our environment. (DW 2011)

Effects on the world due to improper disposal of nuclear waste:

When nuclear energy is being made there is waste that comes with this process, this waste cam be extremely harmful to humans and wildlife if exposed to us, the main effects of radiation is that it can cause cancer. Therefore, proper disposal is crucial, the most common method of disposal is burying the waste, however in the past there has been a spread of nuclear waste by dust storms spreading nuclear waste that was not properly buried. This resulted in the contamination of water such as ponds and lakes that are widely used by humans and wildlife. (Rinkesh, 2019)

Nuclear waste can also be disposed of in large steel cylinders, if these cylinders become compromised this can lead to a leak of radioactive material.

All this improper disposal of nuclear waste is leading to us being exposed to harmful substances in our food and our water due to our reservoirs being contaminated with radioactive waste. This

can lead to babies being born with health problems and defects, this is humans as the radioactive waste can cause cancer and other health problems. (Vidal. J 2019)

Emissions released during the production of nuclear energy:

The production of nuclear energy itself does not release any C02 or air pollution so it is considered a clean source of energy, however the materials necessary for the production of nuclear energy require lots of energy and can be harmful to the environment during mining and making of these materials.

In the process of making nuclear energy a metal called uranium is used, uranium is a metal that plays a crucial part in the process as it allows for a fission chain reaction to occur. Uranium needs to be mined and milled from the earth in order to be used, during this mining there is the need for diesel and electricity in order to keep the mining machinery running, this means C02 gas being released during this process along with other pollutants. (Mudd, G.M. 2008)

Consumption of water of water during the generation of nuclear energy and the harm involved to the wildlife:

During the process of creating nuclear energy massive amounts of water a needed in order to cool down the uranium core of the reactors. Water is also circulated through the steam generators to allow the steam to be produced.

Nuclear power plants are always located near source of water such as a lake, this is because the whole operation relies on water hugely in order to cool down the reactor core, water is also used to cool the steam produced back into water. Water is also used to cool down the fuel used in the process. (Duke, 2014)

As nuclear plants take in large volumes of water from lakes and other bodies of water this water needs some way of being taken in. The plant will suck in this water and then filter this water through screens, when being filtered through these screens fish and their eggs can pass through these screens and are killed as a result. For larger fish that are too large to pass through the screens can become trapped against the screens which will also result in them being killed. Fish are not the only organisms that are being killed many sea turtles and seals are being harmed or killed by this system as well.

As the water enters into the plant it is piped through the system to cool the steam and cool the plant, the water reaches high temperatures and is then released back into the source of water, as the water is hot this therefore will cause a rise in temperature for the lake or body of water which will affect the wildlife as they are not used to this temperature of the water. (Henderson, Dr. P. 2011)

Conclusion:

In conclusion, through my investigation of the effects of nuclear energy on the world we can see that the creation of nuclear energy can go wrong in the case of a nuclear meltdown, also the effects of improper waste disposal can be seen. Despite nuclear energy being a zero-emission

energy, it is now clear to see that the mining of uranium can be harmful to our environment due to its output of C02.

During my research I also found how nuclear plants cause so much harm to wildlife and how they are destroying these animals eco systems. I have also found out that nuclear plant requires great amounts of water in order to operate and how the amounts of water taken from lakes and rivers are affecting the wildlife.

It is clear to see after conducting my research that even though nuclear energy does pose risks and harm to the environment I do believe that nuclear energy is the future of our energy once these issues have been sorted and there is a proper solution for the disposal of nuclear waste, I believe this as nuclear energy is extremely efficient in its production in comparison to its rivals gas and oil.

Bibliography:

1. DW (2011), ‘The science behind how a nuclear meltdown occurs’. March 12th 2011. https://www.dw.com/en/the-science-behind-how-a-nuclear-meltdown-occurs/a-14907961
2. Rinkesh (2019), ‘Nuclear waste disposal’. May 2019. https://www.conserve-energy-future.com/dangers-and-effects-of-nuclear-waste-disposal.php
3. Raymond L. Murray and Keith E.Holbert (2015). Nuclear Energy. 7th edition. Butterworth-Heinemann
4. John Vidal (2019), ‘What should we do with radioactive nuclear waste?’. August 1st 2019. https://www.theguardian.com/environment/2019/aug/01/what-should-we-do-with-radioactive-nuclear-waste
5. Mudd, G.M. (2008), ‘Calcultaing the enviromental cost of mining uranium’. May 2008. https://ec.europa.eu/environment/integration/research/newsalert/pdf/109na4_en.pdf
6. Duke Energy (2014), ‘Importance of water at nuclear plants’. January 22nd 2014. https://nuclear.duke-energy.com/2014/01/22/importance-of-water-at-nuclear-plants
7. Dr. Peter A. Henderson (2011), ‘Giant fish blenders:How power plants kill fish and damage our waterways (and what can be done to stop them)’. July 2011. https://vault.sierraclub.org/pressroom/media/2011/2011-08-fish-blenders.pdf