A Review on Nuclear Power Plant

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Abstract - ***Nuclear power[1]*** *can play a characteristic in carbon free production of electrical power, for that reason making it exciting for tomorrow's power mix. However, some of troubles need to be addressed. In* ***fission generation[2]****, the format of so-known as fourth generation reactors show brilliant promise, eparticularly in addressing materials everyday ordinary overall performance and safety troubles. If efficaciously developed, such reactors may additionally moreover furthermore moreover have an vital and sustainable detail in future power production. Working* ***fusion reactors[3]*** *may be even greater materials inexperienced and* ***environmental friendly[4]****, but moreover need greater development and research. The roadmap for development of* ***fourth generation[5]*** *fission and fusion reactors, therefore, asks for hobby and research withinside those fields need to be strengthened.*

Key Words: [1]**Nuclear power**, [2]**fission generation**, [3]**fusion reactors**, [4]**environmental friendly,** [5]**fourth generation**

1. INTRODUCTION

Nuclear energy flowers are a form of energy plant that use the manner of nuclear fission so one can generate power. They try this with the aid of using the usage of nuclear reactors in mixture with the Rankine cycle, wherein the warmth generated with the aid of using the reactor converts water into steam, which spins a turbine and a generator. Nuclear energy gives the sector with round 11% of its overall power, with the biggest manufacturers being the US and France. India produces round 3.2%(2019) of overall power production.

Figure 1. The Darlington nuclear power plant in Ontario produces power from four 878 MW CANDU reactors.

Aside from the supply of heat, nuclear energy flowers are very just like coal-fired energy flowers. However, they require extraordinary protection measures because the usage of nuclear gas has hugely extraordinary homes from coal or different fossil fuels. They get their thermal energy from splitting the nuclei of atoms of their reactor core, with uranium being the dominant desire of gas with inside the international today.

Thorium additionally has ability use in nuclear energy production, but it isn't always presently in use. Below is the fundamental operation of a boiling water energy plant, which indicates the numerous additives of a energy plant, along side the era of power.

2. Nuclear Power Reactors

- Most nuclear electricity is generated using just two kinds of reactors which were developed in the 1950s and improved since.
- The first generation of these reactors have all been retired, and most of those operating are second-generation.
- New designs are coming forward, both large and small.

About 10% of the world's electricity is produced from nuclear energy.

2.1 How does a nuclear reactor produce electricity?

A nuclear reactor produces and controls the release of power from splitting the atoms of positive elements. In a nuclear strength reactor, the power released is used as heat to make steam to generate energy. (In a research reactor the precept reason is to utilise the actual neutrons produced with inside the core. In most naval reactors, steam drives a turbine straight away for propulsion.)

The requirements for using nuclear strength to deliver energy are the equal for optimum types of reactor. The power released from non-forestall fission of the atoms of the gas is harnessed as heat in each a fueloline or water, and is used to deliver steam. The steam is used to energy the turbines which produce energy (as in most fossil gas plants).

The world's first nuclear reactors 'operated' naturally in a uranium deposit about two billion years ago. These were in rich uranium orebodies and moderated by percolating rainwater. The 17 known at Oklo in West Africa, each less than 100 kW thermal, together consumed about six tonnes of uranium. It is assumed that these were not unique worldwide.

Today, reactors derived from designs with inside the starting developed for propelling submarines and big naval ships generate about 85% of the world's nuclear electricity. The important format is the pressurized water reactor (PWR) which has water at over 300°C beneathneath stress in its primary cooling/warm temperature transfer circuit, and generates steam in a outer circuit. The a lot much less numerous boiling water reactor (BWR) makes steam with inside the primary circuit above the reactor core, at similar temperatures and stress. Both kinds use water as every coolant and moderator, to gradual neutrons. Since water normally boils at 100°C, they have robust metallic stress vessels or tubes to allow the higher jogging temperature. (Another type uses heavy water, and with deuterium atoms, as the moderator. Hence the term 'mild water' is used to differentiate.)

2.2 Components of a nuclear reactor

There are several components common to most types of reactor:

2.2.1 Fuel

Uranium is the basic fuel. Usually pellets of uranium oxide (UO2) are arranged in tubes to form fuel rods. The rods are arranged into fuel assemblies in the reactor core.* In a 1000 MWe class PWR there might be 51,000 fuel rods with over 18 million pellets.* In a new reactor with new fuel a neutron source is needed to get the reaction going. Usually this is beryllium mixed with polonium, radium or other alpha-emitter. Alpha particles from the decay cause a release of neutrons from the beryllium as it turns to carbon-12. Restarting a reactor with some used fuel may not require this, as there may be enough neutrons to achieve criticality when control rods are removed.

2.2.2 Moderator

Material in the core which slows down the neutrons released from fission so that they cause more fission. It is usually water, but may be heavy water or graphite.

2.2.3 Control rods or blades

These are made with neutron-absorbing material such as cadmium, hafnium or boron, and are inserted or withdrawn from the core to control the rate of reaction, or to halt it.* In some PWR reactors, special control rods are used to enable the core to sustain a low level of power efficiently. (Secondary control systems involve other neutron absorbers, usually boron in the coolant – its concentration can be adjusted over time as the fuel burns up.) PWR control rods are inserted from the top, BWR cruciform blades from the bottom of the core.* In fission, most of the neutrons are released promptly, but some are delayed. These are crucial in enabling a chain reacting system (or reactor) to be controllable and to be able to be held precisely critical.

2.2.4 Coolant

A fluid circulating through the core so as to transfer the heat from it. In light water reactors the water moderator functions also as primary coolant. Except in BWRs, there is a secondary coolant circuit where the water becomes steam. (See also later section on primary coolant characteristics.) A PWR has two to four primary coolant loops with pumps, driven either by steam or electricity – China's Hualong One design has three, each driven by a 6.6 MW electric motor, with each pump set weighing 110 tonnes.

2.2.5 Pressure vessel or pressure tubes

Usually a robust steel vessel containing the reactor core and moderator/coolant, but it may be a series of tubes holding the fuel and conveying the coolant through the surrounding moderator.

2.2.6Steam generator

Part of the cooling system of pressurised water reactors (PWR & PHWR) where the high-pressure primary coolant bringing heat from the reactor is used to make steam for the turbine, in a secondary circuit. Essentially a heat exchanger like a motor car radiator.* Reactors have up to six 'loops', each with a steam generator. Since 1980 over 110 PWR reactors have had their steam generators replaced after 20-30 years service, over half of these in the USA.* These are large heat exchangers for transferring heat from one fluid to another – here from high-pressure primary circuit in PWR to secondary circuit where water turns to steam. Each structure weighs up to 800 tonnes and contains from 300 to 16,000 tubes about 2 cm diameter for the primary coolant, which is radioactive due to nitrogen-16 (N-16, formed by neutron bombardment of oxygen, with half-life of 7 seconds). The secondary water must flow through the support structures for the tubes. The whole thing needs to be designed so that the tubes don't vibrate and fret, operated so that deposits do not build up to impede the flow, and maintained chemically to avoid corrosion. Tubes which fail and leak are plugged, and surplus capacity is designed to allow for this. Leaks can be detected by monitoring N-16 levels in the steam as it leaves the steam generator.

2.2.7 Containment

The structure around the reactor and associated steam generators which is designed to protect it from outside intrusion and to protect those outside from the effects of radiation in case of any serious malfunction inside. It is typically a metre-thick concrete and steel structure.Newer Russian and some other reactors install core melt localisation devices or 'core catchers' under the pressure vessel to catch any melted core material in the event of a major accident.

There are several different types of reactor as indicated in the following table.

Nuclear power plants in commercial operation or operable

Reactor type	Main countries	Number	GWe	Fuel	Coolant	Moderator
Pressurised water reactor (PWR)	USA, France, Japan, Russia, China, South Korea	301	286	enriched UO_2	water	water
Boiling water reactor (BWR)	USA, Japan, Sweden	64	65	enriched UO_2	water	water
Pressurised heavy water reactor (PHWR)	Canada, India	48	24	natural UO_2	heavy water	heavy water
Advanced gas-cooled reactor (AGR)	UK	14	8	natural U (metal), enriched UO_2	CO_2	graphite
Light water graphite reactor (LWGR)	Russia	12	8.4	enriched UO_2	water	graphite
Fast neutron reactor (FBR)	Russia	2	1.4	PuO_2 and UO_2	liquid sodium	none
TOTAL		441	393			

2.3 Fuelling a nuclear reactor

Most reactors want to be close down for refuelling, in order that the reactor vessel may be opened up. In this situation refuelling is at durations of 12, 18 or 24 months, while 1 / 4 to a 3rd of the gas assemblies are changed with clean ones. The CANDU and RBMK sorts have strain tubes (in preference to a strain vessel enclosing the reactor core) and may be refuelled below load through disconnecting person strain tubes. The AGR is likewise designed for refuelling on-load.

If graphite or heavy water is used as moderator, it's far viable to run a strength reactor on herbal rather than enriched uranium. Natural uranium has the identical elemental composition as while it turned into mined (0.7% U-235, over 99.2% U-238), enriched uranium has had the percentage of the fissile isotope (U-235) extended through a method referred to as enrichment, normally to 3.five-five.0%. In this situation the moderator may be regular water, and such reactors are together referred to as mild water reactors. Because the mild water absorbs neutrons in addition to slowing them, it's far much less green as a moderator than heavy water or graphite. Some new small reactor designs require excessive-assay low-enriched uranium gas, enriched to close to 20% U-235.

During operation, a number of the U-238 is modified to plutonium, and Pu-239 finally ends up supplying approximately one-0.33 of the electricity from the gas.

In maximum reactors the gas is ceramic uranium oxide (UO_2 with a melting factor of 2800°C) and maximum is enriched. The gas pellets (normally approximately 1 cm diameter and 1.five cm long) are usually organized in an extended zirconium alloy (zircaloy) tube to shape a gas rod, the zirconium being hard, corrosion-resistant and obvious to neutrons.* Numerous rods shape a gas meeting, that is an open lattice and may be lifted into and out of the reactor core. In the maximum not unusualplace reactors those are approximately four metres long. A BWR gas meeting can be approximately 320 kg, a PWR one 655 kg, wherein case they preserve 183 kg uranium and 460 kgU respectively. In both, approximately a hundred kg of zircaloy is involved.

* Zirconium is an vital mineral for nuclear strength, in which it unearths its most important use. It is consequently problem to controls on trading. It is typically infected with hafnium, a neutron absorber, so very pure 'nuclear grade' Zr is used to make the zircaloy, which is set 98% Zr plus approximately 1.five% tin, additionally iron, chromium and occasionally nickel to beautify its strength.

A large enterprise initiative is to expand accident-tolerant fuels that are extra proof against melting below situations inclusive of the ones withinside the Fukushima accident, and with the cladding being extra proof against oxidation with hydrogen formation at very excessive temperatures below such situations.

Burnable poisons are regularly utilized in gas or coolant to even out the overall performance of the reactor over the years from clean gas being loaded to refuelling. These are neutron absorbers which decay below neutron exposure, compensating for the revolutionary increase of neutron absorbers withinside the gas as it's far burned, and for this reason permitting better gas burn-up (in phrases of GW days consistent with tonne of U)*. The quality acknowledged is gadolinium, that is a essential aspect of gas in naval reactors in which putting in clean gas may be very inconvenient, so reactors are designed to run extra than a decade among refuellings (complete strength equivalent – in exercise they may be now no longer run continuously). Gadolinium is integrated withinside the ceramic gas pellets. An opportunity is zirconium diboride critical gas burnable absorber (IFBA) as a skinny coating on everyday pellets.

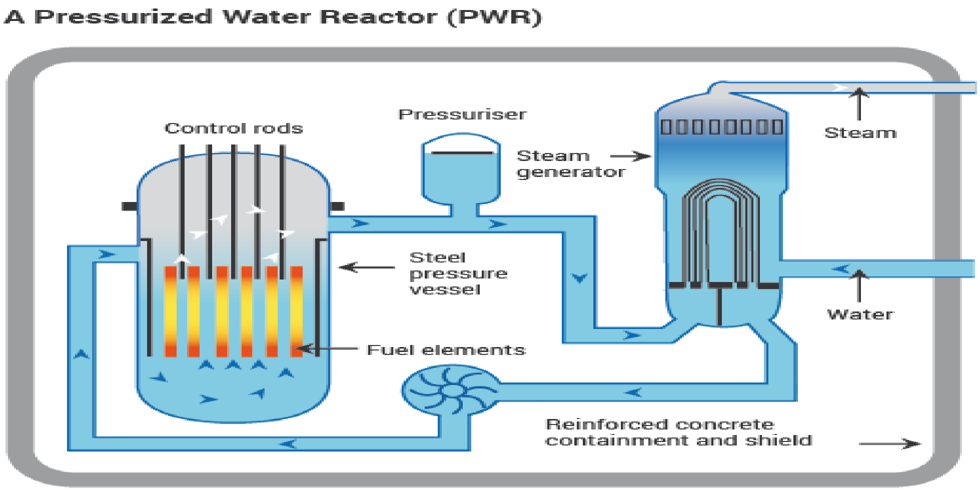
* Average burn-up of gas utilized in US reactors has growth to almost 50 GWd/t, from 1/2 of that withinside the 1980s.

Gadolinium, in most cases at as much as 3g oxide consistent with kilogram of gas, calls for barely better gas enrichment to atone for it, and additionally after burn-up of approximately 17 GWd/t it keeps approximately four% of its absorbtive impact and does now no longer lower further. The ZrB_2 IFBA burns away extra progressively and completely, and has no effect on gas pellet properties. It is now utilized in maximum US reactors and some in Asia. China has the generation for AP1000 reactors

3. Main types of nuclear reactor

[1] 3.1 Pressurised water reactor (PWR) (Generation II)

This is the maximum not unusualplace type, with approximately three hundred operable reactors for energy technology and numerous hundred extra hired for naval propulsion. The layout of PWRs originated as a submarine energy plant. PWRs use everyday water as each coolant and moderator. The layout is outstanding through having a number one cooling circuit which flows thru the middle of the reactor beneathneath very excessive strain, and a secondary circuit wherein steam is generated to power the turbine. In Russia those are referred to as VVER types – water-moderated and -cooled.



A PWR has gasoline assemblies of 200-three hundred rods each, organized vertically withinside the middle, and a massive reactor might have approximately a hundred and fifty-250 gasoline assemblies with 80-a hundred tonnes of uranium.

Water withinside the reactor middle reaches approximately 325°C, for this reason it need to be saved beneathneath approximately a hundred and fifty instances atmospheric strain to save it from boiling. Pressure is maintained through steam in a pressuriser (see diagram). In the number one cooling circuit the water is likewise the moderator, and if any of it became to steam the fission response might gradual down. This bad comments impact is one of the protection capabilities of the type. The secondary shutdown machine includes including boron to the number one circuit.

The secondary (outer) circuit is beneathneath much less pressure and the water right here boils withinside the warmness exchangers which might be as a consequence steam generators. The steam drives the turbine to supply electricity, and is then condensed and again to the warmth exchangers in touch with the number one circuit.

[2] 3.2 Boiling water reactor (BWR) (Generation II)

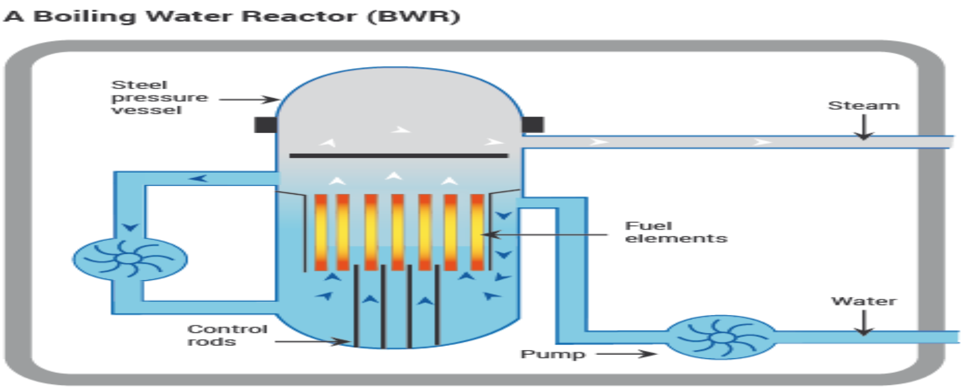
This sort of reactor has many similarities to the PWR, besides that there may be most effective a unmarried circuit wherein the water is at decrease pressure (approximately seventy five instances atmospheric pressure) in order that it boils withinside the middle at approximately 285°C. The reactor is designed to function with 12-15% of the water withinside the pinnacle a part of the middle as steam, and therefore with much less moderating impact and therefore performance there. BWR devices can function in load-following mode extra easily than PWRs.

The steam passes via drier plates (steam separators) above the middle after which without delay to the turbines, which might be therefore a part of the reactor circuit. Since the water across the middle of a reactor is usually infected with strains of radionuclides, it manner that the turbine should be shielded and radiological safety furnished at some point of maintenance. The price of this has a tendency to stability the financial savings because of the less complicated design. Most of the radioactivity withinside the water could be very short-lived*, so the turbine corridor may be entered quickly after the reactor is close down.

* frequently N-16, with a 7 2d half-life

A BWR gasoline meeting incorporates 90-one hundred gasoline rods, and there are as much as 750 assemblies in a reactor middle, conserving as much as a hundred and forty tonnes of uranium.

The secondary manipulate gadget includes proscribing water glide via the middle in order that extra steam withinside the pinnacle element reduces moderation.

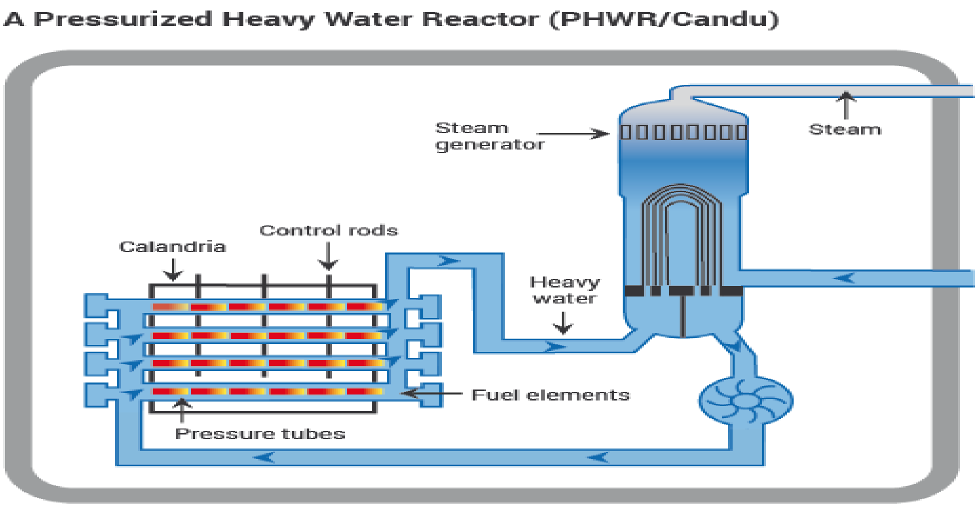


[3] 3.3 Pressurised heavy water reactor (PHWR) (Generation II)

The PHWR reactor has been advanced because the Fifties in Canada because the CANDU, and from Eighties additionally in India. PHWRs typically use herbal uranium (0.7% U-235) oxide as gasoline, therefore wishes a extra green moderator, in this example heavy water (D2O).** The PHWR produces extra strength in step with kilogram of mined uranium than different designs, however additionally produces a far large quantity of used gasoline in step with unit output.

** with the CANDU device, the moderator is enriched (i.e. water) in place of the gasoline – a fee trade-off.

The moderator is in a massive tank known as a calandria, penetrated via way of means of numerous hundred horizontal strain tubes which shape channels for the gasoline, cooled via way of means of a glide of heavy water beneathneath excessive strain (approximately one hundred instances atmospheric strain) withinside the number one cooling circuit, normally accomplishing 290°C. As withinside the PWR, the number one coolant generates steam in a secondary circuit to force the turbines. The strain tube layout way that the reactor may be refuelled step by step with out shutting down, via way of means of separating person strain tubes from the cooling circuit. It is likewise much less high-priced to construct than designs with a massive strain vessel, however the tubes have now no longer proved as durable.



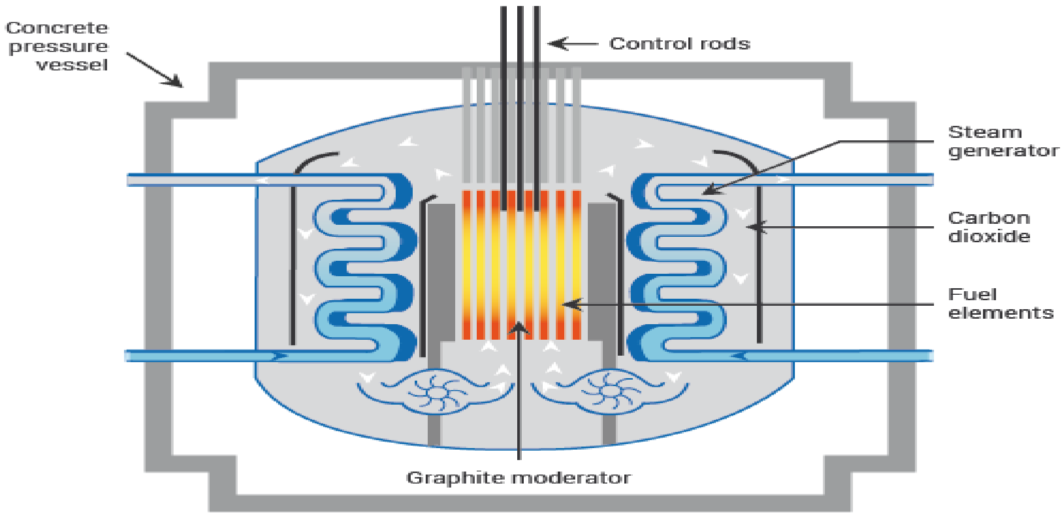
A CANDU gasoline meeting includes a package deal of 37 1/2 of metre lengthy gasoline rods (ceramic gasoline pellets in zircaloy tubes) plus a guide structure, with 12 bundles mendacity quit to result in a gasoline channel. Control rods penetrate the calandria vertically, and a secondary shutdown device entails including gadolinium to the moderator. The heavy water moderator circulating thru the frame of the calandria vessel additionally yields a few heat (aleven though this circuit isn't always proven at the diagram above).

Newer PHWR designs together with the Advanced Candu Reactor (ACR) have mild water cooling and slightly-enriched gasoline.

CANDU reactors can be given plenty of fuels. They can be run on recycled uranium from reprocessing LWR used gasoline, or a mix of this and depleted uranium left over from enrichment plants. About 4000 MWe of PWR would possibly then gasoline one thousand MWe of CANDU capacity, with addition of depleted uranium. Thorium can also be utilized as fuel.

[4] 3.4 Advanced gas-cooled reactor (AGR) (Generation II)

These are the second generation technology of British gas-cooled reactors, the use of graphite moderator and carbon dioxide as number one coolant. The gasoline is uranium oxide pellets, enriched to 2.5 - 3.5%, in chrome steel tubes. The carbon dioxide circulates thru the core, accomplishing 650°C after which beyond steam generator tubes outdoor it, however nonetheless in the concrete and metallic stress vessel (hence 'integral' design). Control rods penetrate the moderator and a secondary shutdown machine includes injecting nitrogen to the coolant. The excessive temperature offers it a excessive thermal efficiency – approximately 41%. Refuelling may be on-load.



The AGR became evolved from the Magnox reactor. Magnox reactors had been additionally graphite moderated and CO_2 cooled, used herbal uranium gasoline in metallic form, and water as secondary coolant. The UK's remaining Magnox reactor closed on the give up of 2015.

[5] 3.5 Light water graphite-moderated reactor (LWGR) (Generation III)

The most important LWGR layout is the RBMK, a Soviet layout, evolved from plutonium manufacturing reactors. It employs long (7 metre) vertical strain tubes walking thru graphite moderator, and is cooled with the aid of using water, that is allowed to boil withinside the center at 290°C and at approximately 6.nine MPa, a great deal as in a BWR. Fuel is low-enriched uranium oxide made up into gasoline assemblies 3.five metres long. With moderation in large part because of the constant graphite, extra boiling sincerely reduces the cooling and neutron absorbtion with out inhibiting the fission reaction, and a high quality comments hassle can arise, that is why they have got in no way been constructed outdoor the Soviet Union.

[6] 3.6 Fast neutron reactor (FNR) (Generation IV) (in developing phase)

Some reactors do now no longer have a moderator and utilise speedy neutrons, producing energy from plutonium whilst making greater of it from the U-238 isotope in or across the fuel. While they get greater than 60 instances as a great deal strength from the unique uranium in comparison with regular reactors, they may be pricey to build. Further improvement of them is probably withinside the subsequent decade, and the primary designs predicted to be constructed in many years are FNRs. If they may be configured to supply greater fissile material (plutonium) than they devour they may be known as speedy breeder reactors (FBR).

4. Main types of nuclear reactor (generation wise)

Several generations of reactors are normally distinguished. Generation I reactors have been advanced withinside the 1950-60s and the closing one (Wylfa 1 withinside the UK) close down on the cease of 2015. They typically used herbal uranium gasoline and used graphite as moderator. Generation II reactors are typified via way of means of the prevailing US fleet and maximum in operation elsewhere. They commonly use enriched uranium gasoline and are typically cooled and moderated via way of means of water. Generation III are the superior reactors advanced from these, the primary few of that are in operation in Japan and from early 2018, in China, Russia and the UAE. Others are below creation and prepared to be ordered. They are tendencies of the second one era with more advantageous safety. There isn't anyt any clean difference among Generation II and Generation III.

Generation IV designs are nonetheless at the drafting board and could now no longer be operational earlier than the mid-2021s. They will generally tend to have closed gasoline cycles and burn the long-lived actinides now forming a part of spent gasoline, in order that fission merchandise are the handiest excessive-stage waste. Of seven designs below improvement with worldwide collaboration, 4 or 5 can be rapid neutron reactors. Four will use fluoride or liquid metallic coolants, subsequently function at low pressure. Two can be gas-cooled. Most will run at plenty better temperatures than today's water-cooled reactors. See Generation IV Reactors paper.

More than a dozen (Generation III) superior reactor designs are in diverse levels of improvement. Some are evolutionary from the PWR, BWR and CANDU designs above, a few are extra radical departures. The former encompass the Advanced Boiling Water Reactor, some of that are now running with others below creation. Advanced PWRs function in China, Russia and UAE, with extra below creation. The best-recognised radical new layout has the gasoline as massive 'pebbles' and makes use of helium as coolant, at very excessive temperature, probable to power a turbine directly.

Considering the closed gasoline cycle, Generation I-III reactors recycle plutonium (and probable uranium), at the same time as Generation IV are predicted to have complete actinide recycle.

Many superior reactor designs are for small units – below three hundred MWe – and withinside the class of small modular reactors (SMRs), seeing that numerous of them collectively may also contain a massive energy plant, perhaps constructed progressively. Apart from the everyday oxide fuels, different gasoline sorts are metallic, TRISO*, carbide, nitride, or liquid salt.

* TRISO (tristructural-isotropic) debris much less than a millimetre in diameter. Each has a kernel (c. 0.five mm) of uranium oxycarbide (or uranium dioxide), with the uranium enriched as much as 20% U-235. This kernel is surrounded via way of means of layers of carbon and silicon carbide, giving a containment for fission merchandise that is strong to over 1600°C.

5. Floating nuclear power plants

Apart from over hundred nuclear reactors powering severa varieties of ships, Rosatom in Russia has installation a subsidiary to deliver floating nuclear electricity flora ranging in length from 70 to six hundred MWe. These may be installation in pairs on a huge barge, that permits you to be actually moored in which it's far had to deliver electricity and possibly a few desalination to a shore agreement or corporation complex. The first has forty MWe reactors primarily based totally completely totally on the ones in icebreakers and operates at a far flung webweb internet web page in Siberia. Electricity rate is expected to be masses decrease than from gift alternatives.

The Russian KLT-40S is a reactor nicely tested in icebreakers. Here a a hundred fifty MWt unit produces 35 MWe (gross) in addition to as plenty as 35 MW of warmth for desalination or district heating. These are designed to run 3-four years among refuelling and it's far envisaged that they'll be operated in pairs to permit for outages, with on-board refuelling functionality and used fueloline storage. At the give up of a 12-3 hundred and sixty 5 days strolling cycle the complete plant is taken to a vital facility for -3 hundred and sixty 5 days overhaul and elimination of used fueloline, earlier than being lower decrease returned to service.

Second technology Russian FNPPs can have a hundred seventy five MWt, 50 MWe RITM-200M reactor units, every approximately 1500 tonnes lighter however extra effective than KLT-40S, and as a end result on a far smaller barge – approximately 12,000 in vicinity of 21,000 tonnes displacement. Refuelling may be each 10-12 years. Very comparable RITM-hundred reactors electricity the present day Russian icebreakers.

6. Advantages of nuclear energy

6.1. Low-fee electricity

Although constructing nuclear energy plant life has a excessive preliminary fee, it's pretty reasonably-priced to provide electricity from them and that they have low running costs.

6.2. Reliable

One of the largest advantages of nuclear electricity is that it's far a dependable energy era supply. Unlike solar and wind electricity, which want the solar to be shining or the wind to be blowing, nuclear energy may be generated at any time in the course of the day. This approach that a nuclear energy plant can produce electricity nonstop, and also you won't should enjoy any delays in electricity manufacturing.

6.3. Zero carbon emissions

Nuclear energy reactors do now no longer produce any carbon emissions. This is a large benefit over conventional assets of electricity, like fossil fuels, which releases lots of carbon dioxide into the ecosystem. Excess carbon dioxide is one the main reasons of weather change. So, the much less carbon and greenhouse fueloline emissions an electricity supply has, the better. In fact, consistent with the Nuclear Energy Institute (NEI), nuclear energy manufacturing prevents 528 million metric lots of carbon dioxide from being launched into the ecosystem annually.

6.4. High electricity density

It is envisioned that the quantity of electricity launched in a nuclear fission response is ten million instances more than the quantity launched whilst burning fossil fuels. Therefore, the quantity of nuclear gasoline required in a nuclear energy plant is a great deal smaller in comparison to the ones of different sorts of energy plant life. This allows make contributions to the low fee of nuclear electricity. One nuclear energy plant can produce hundreds of megawatt hours of electricity.

6.5. Promising destiny electricity supply

Nuclear fusion is the holy grail of harnessing electricity. If we will discover ways to manage atomic fusion (the equal reactions as people who gasoline the solar), we should nearly have limitless electricity

7. CONCLUSION

The IAEA's projections for global installed nuclear power capacity in the high case indicate an increase from 2016 levels by 42% in 2030, by 83% in 2040 and by 123% in 2050. The low case projects a decline in capacity by 12% in 2030 and 15% in 2040 before rebounding to present levels by 2050. Nuclear power releases less radiation into the environment than any other major energy source. There are pros and cons of every type of energy. The major cons of nuclear energy is that the waste generated from plants is highly radioactive which if not disposed properly can be deadly for all living beings. If scientists were able to find a method to destroy the waste completely, then nuclear power will surely have a promising future.

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