

Ethics in Engineering Practice
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Lecture - 20
Engineers, Nuclear Testing and Weapons (Contd.)

Welcome back, we will be continue with our session on the nuclear weapons and, we will continue with the discussion and formation of ethical policies, with respect to nuclear weapons.

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Formation of ethical policies

There is a need for formulating ethical policies in nuclear organizations with respect to

- Conducting operations at nuclear facilities
- Management systems including quality management and safety culture
- Human resource management including human performance improvement
Training and qualification of personnel

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Let us see what is there; there is a need to formulating for ethical policies in nuclear organization with respect to conducting operations at nuclear facilities, management systems including quality management and safety culture; human resource management including human performance improvement training and qualification of personnel.

Now, why it is required to formulate ethical policies, it in nuclear organization with respect to conducting operations, at nuclear facilities is sometimes it may happen unsafe acts may take place. So, who is responsible for that? Is it the fault of the equipment, or is it the fault of the person, or is it because no standard processes is written how to operate at that facility.

So, when we want to see like who is responsible, then this becomes questions of ethical issues. So, what will determine and ethical operations and, nuclear facilities needs to be defined, like what is the proper use of the like equipments, how to deal with that what is what will, we counted as an unsafe act etcetera.

So, it is not only that the safety culture, or the quality management practices these are also important management system, because a culture needs to be imbibed within the persons. So, that it is there in the air it is there in the system and, they have to follow it if they want to be a part of that organization. So, the management system including quality management and safety, culture is very important with respect to ethical policies in nuclear organizations.

Third is for the training and qualification of personnel the competencies for dealing, with this like high risk involved equipments what are their like how their performances can be improved so, what is their training required. So, that they follow the processes procedures involved in using these things equipments, needs to be ethical policies needs to be formulated, for those things also.

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- Open and transparent decision making and communication methods
- Physical protection and control of nuclear materials
- Experience feedback and corrective action systems.

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Next what we find is important is open and transparent decision making and communication methods. This is very important thing, because as we have discussing earlier, it should not be a blame game it was your responsibility you have not done it, or why this organization has not taken care of something. It the environment should not be

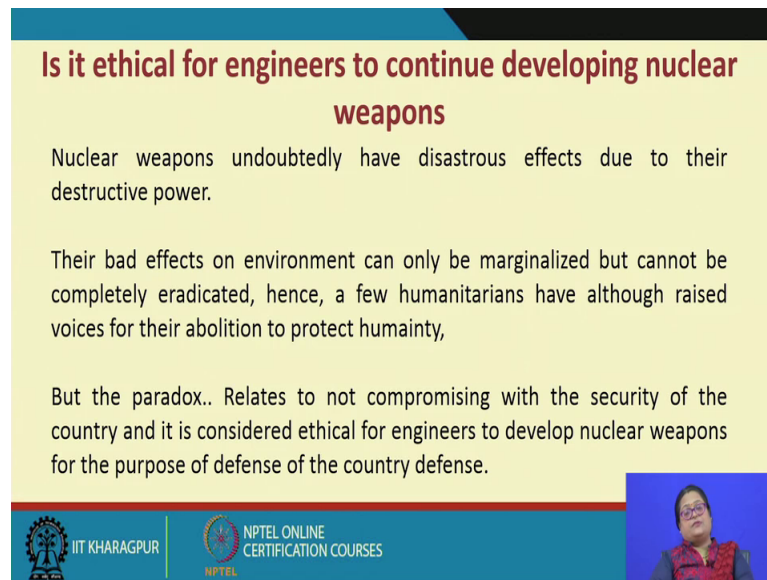
like that the environment should be open enough. So, that and transparent enough so, that if because we understand this is a high risk involved, instead of blaming of the person instead of going for conflict with the person, everyone should be very task focused over here, because we cannot risk the lives of millions and millions of people, or we cannot like compromise with the like well being in the environment.

So, if some wrong or fault is detected and some decision needs to be taken about it, then or it needs to be communicated, they there should be transparent decision making process and the communication method open and transparent. So, that everybody can communicate with the other about the like importance of the task at hand and, like get the corrective actions taken. So, for that open and transparent decision making and communication methods are important. Physical protection and control of nuclear materials, this is another important very very important thing. Because how these materials are protected how they are controlled how they are stored because radiations may happen.

So, these are important requirements for like ethical, ethical issues with related with the nuclear ethics and, because this may cause again harm to people. So, proper what means proper storage, what means proper control, what if somewhere it is not that culture is not there, what if some person is not following, then what are the steps to be taken for that. So, what are the codes of conduct needs to be defined in these cases.

So, experience feedback and corrective action system. So, this is another important thing everybody should give their feedback about their experiences, and there should be corrective action system present in the organization, which can try to answer to the any minor problem that is happening, how corrections can be made and to see like the fault is not repeated again. So, these for everything a code of conduct a way of doing things needs to be pleased, because we have to understand this is a very high risk kind of thing and, we cannot be casual about it.

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Is it ethical for engineers to continue developing nuclear weapons

Nuclear weapons undoubtedly have disastrous effects due to their destructive power.

Their bad effects on environment can only be marginalized but cannot be completely eradicated, hence, a few humanitarians have although raised voices for their abolition to protect humanity,

But the paradox.. Relates to not compromising with the security of the country and it is considered ethical for engineers to develop nuclear weapons for the purpose of defense of the country defense.

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Now, we will come to a very basic question like, when we have been repeating like it is very high risk it may cause destruction it mean, cause mass destruction which may lead to maybe claiming lives of people and, like through generations those who remain there that may be may be disastrous for the generations to come also. Then a very basic question may arise like is it ethical for the engineers to continue developing nuclear weapons, let us see into it.

So, we understand like, there is a paradox in it its lightning, undoubtedly it has a very disastrous effect due to their destructive power, their bad effect on the environment can be marginalized, but cannot me completely eradicated hence a few humanitarians of all the raised voices, for their abolition to protect humanity. But again there is a paradox about it so, but a with which talks of not to compromise with the security of the country, because when we are talking of nuclear deterrence, there are two parts like nuclear warfare and, nuclear deterrence when you are talking of nuclear deterrence, it is the security part of the like self defense and making much of secure. So, that the and preventing further war.

So, in that case when you are talking of nuclear deterrence so, it is talking of not to compromise with the security of the country, because it is a matter of trust and trustworthiness like, if somebody declares like we are not going to do a nuclear warfare. And maybe we are not going for developing a nuclear weapons question comes to what

extent, we can trust that nation how do we know like tomorrow that mission is not going to he just back with the nuclear weapons.

So, taking those considerations views so, it is considered to be ethical for engineers to develop nuclear, weapons for the purpose of the defense of the country. So, if you are talking of the security and defense of the country at large. So, it is considered ethical for the engineers to develop nuclear weapons, for the purpose of the safety of the country.

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The slide is titled "Continued" in red text. Below the title, it says "The main stakeholders include;". There is a list of six items, each preceded by a square checkbox:

- Government
- Alliances (Government partnership with other countries in form of any
- treaties signed with respect to nuclear weapons developments and testing)
- Nuclear weapons manufacturers
- Engineers and Scientists
- Common public

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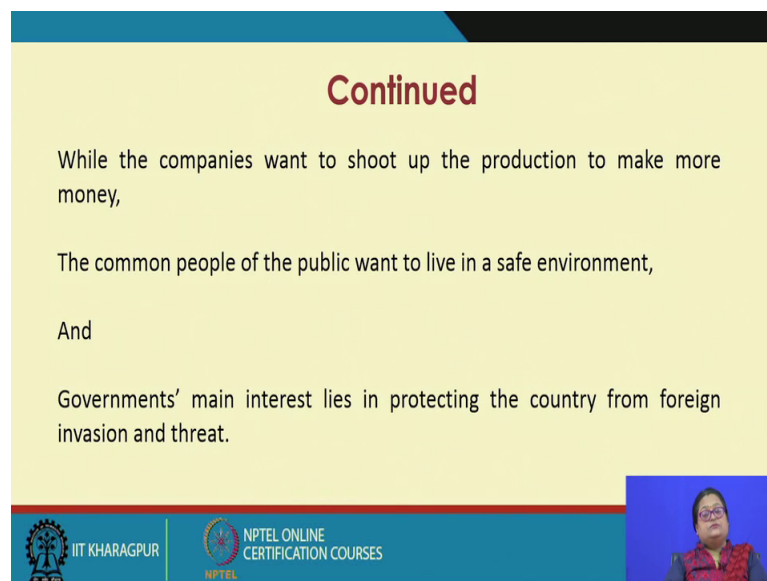
However, in this the main stakeholders involved, there are lot of stakeholders like government. Because, government has to take a decision alliances government partnership with other countries in the form of any treaties signed, with respect to nuclear weapons developments and testing, we were talking of arms control we are talking of disarmament. So, this like it is not a single country, which can decide on it and practice it there needs to be are like, good collection of countries partnership amongst the countries, who mutually decide to do something and respect what they decide this is that is they keep their words, what they have decided on and not revert back to old practices of like fighting with nuclear weapons.

So, if a few countries have signed a treaty regarding like, nuclear disarmament or arms control, it is very important for the countries to respect the treaty and not to work out of it, in terms of like whenever they feel like and, even if there is a like lot of temptation to work out from it. So, what is the integrity of their action what is the trustworthiness of

their action. These are very important things like would you related to the relation of the alliances, in terms of like developing of their nuclear weapons and testing them. So, third is of the author important stakeholder is the nuclear weapon manufacturer, then it is a engineers and scientists and, common public these are the main stakeholders, who are connected to understanding the you know like, what are the policies and practices with respect to like.

If you are talking of having if you are talking of developing nuclear weapon and, if you are talking of the security of the country at large. So, there are different stakeholders as we have told, and they need to come to a common agreement and, why you have listed this in they need to come to common agreement and, why we have listed this in this order of importance is of course, government and alliances are most important because, they are the people who are making decision with respect to their nuclear weapons and policies related to them.

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While the companies want to shoot up the production to make more money,

The common people of the public want to live in a safe environment,

And

Governments' main interest lies in protecting the country from foreign invasion and threat.

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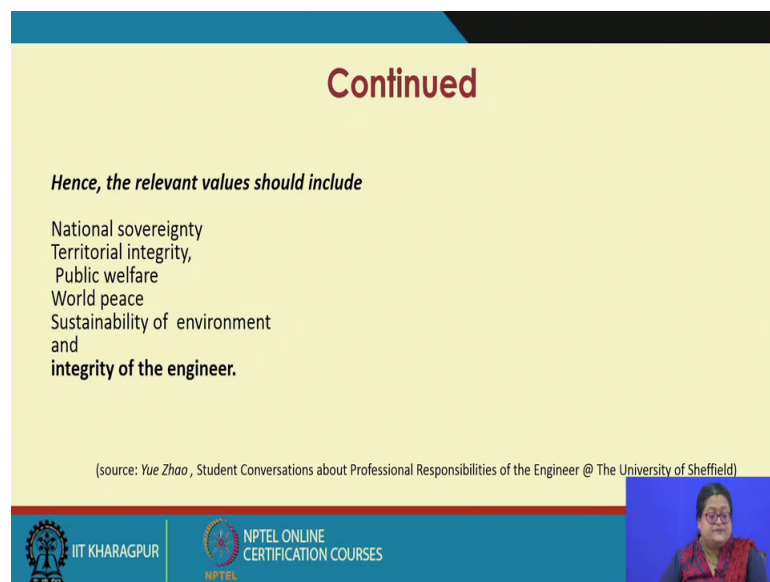
So, sometimes what happens like there could be a conflict of interest also, or there could be focus of interest of the different parties could be different. So, it is very important like they come to a consensus like, as it is mentioned over here. The common people would want to live a safe environment. And the companies would want to shoot up the production to make more money and, the government means in main interest lies in protecting the country from foreign invasion and threat.

So, if we feel like the government's main interest lies in protecting the country from foreign invasion and threat. And the public want to live a safe environment, live in a safe environment and if we feel, if the government truly feels and the people to do feel like the nuclear weapon is the only answer, then we have to ask a question have it try it for other alternatives yes or no.

So, if they have tried and failed and then maybe they decide on the nuclear weapons and the companies also want to shoot up the production. So, there will be one type of policy, but if again the government and the general public fails no, there are greater consequences of bigger consequences of using these weapons. And these losses are irreversible losses and we decide not to use that weapon. So, even while maybe the companies want to shoot up the production and all.

So, then the government and the common people will not be very agreeable to those things and maybe decide for arms control, or disarmament. So, it depends on how the each of the stakeholders like and looking at the issue and collectively what they arrive at, what particular decision that they arrived at.

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Hence, the relevant values should include

- National sovereignty
- Territorial integrity,
- Public welfare
- World peace
- Sustainability of environment
- and
- integrity of the engineer.**

(source: Yue Zhao , Student Conversations about Professional Responsibilities of the Engineer @ The University of Sheffield)

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So, for this the relevant values, which are very important time and again when we are discussing about the computer ethics and when you are talking about the nuclear ethics. The word which is getting repeated again and again is the duty ethics; it is the ethics of the engineers in terms of their values, in terms of their virtues.

So, the relevant values which will be included over here, a national sovereignty territorial integrity public welfare, world peace sustainability of the environment and of course, integrity of the engineer. The integrity of the engineer who is developing, these things for what purpose it is getting developed is like the person agreeable to the cause for what the weapon is getting used. So, these are relevant values which are there for their nuclear ethics.

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The disputed fact can be whether the nuclear weapons should still exist in the world.

Options for actions include

- (1) Use nuclear deterrence as an important instrument for security
- (2) Every country gives up the nuclear weapon at the same time.

(source: Yue Zhao , Student Conversations about Professional Responsibilities of the Engineer @ The University of Sheffield)

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So, there could be as we are telling like as there are multiple stakeholders, there could be conflict in their interest, there could be differences in how they are looking at a particular problem of whether to continue having nuclear weapon or not.

So, that that becomes a very disputed fact like, whether the nuclear weapon should still be there in the world or not. So, the options for actions include use nuclear deterrence as an important instrument for security, or to every country gives up the nuclear weapon at the same time. So, this we find then there could be two things like use nuclear deterrence, where you are taking developing this weapons is a part of your strength and, security or everybody is giving up the weapon at the same time this could be the two options.

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Theory of Utilitarianism and Nuclear weapons

Theory of Utilitarianism : *“Those actions should be chosen that lead to maximum amount of happiness”*

This indicates that out of the various options available only that option should be picked up which results in greatest happiness for the people.

As everyone in the world pursues peace, people will feel happier if there are fewer wars and deaths.

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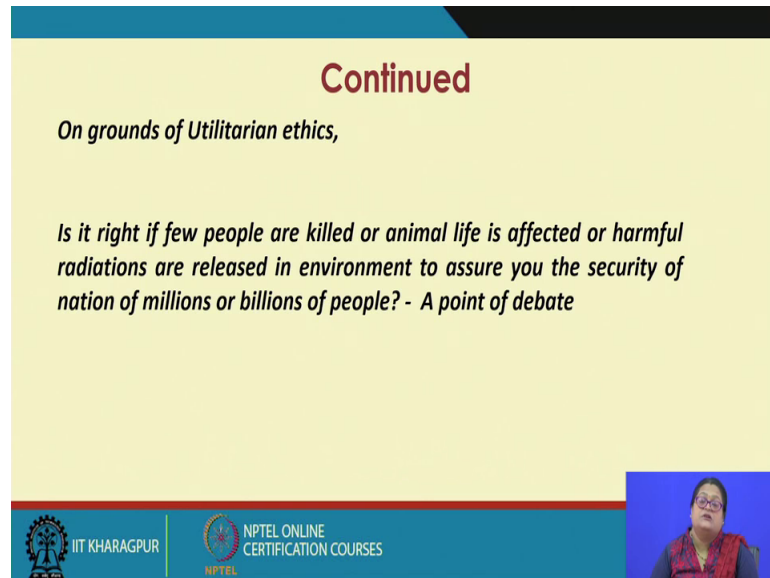
And whatever is decided there should be a consensus between the parties, who are involved in it there should be consensus amongst the stakeholders who are involved in it. See if all the countries are not giving up the weapons at the same point of time and, we are talking of like to some nuclear disarmament. So, it will be perceived as a threat by some countries who have given up some by some countries, who have given up the weapons, but and waiting for the others to give up, but they are still not giving up the weapon.

So, if it is not an action which is taken by all at the same point of time, for the time in between where one country has given up the weapon, that the and waiting for the other countries to give up the weapon could be very very stressful for that country and is unethical also. So, how if a policy is framed it needs to be executed and, what are the consequences of that policy needs to be revisited again and again before we like try to establish a particular policy regarding nuclear weapons. We will try to see the nuclear deterrence from the theory of utilitarianism and nuclear weapons.

So, as we understand utilitarianism has been defined as those actions, which should be chosen that lead to maximum amount of happiness. So, this indicates that out of the various options available only that option should be chosen, which gives a greatest happiness for the people. So, according to this agreement is if people are pursuing for

peace. Then people with fewer wars and deaths, will be the most happy people they may feel happier, if there are fewer wars and death.

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On grounds of Utilitarian ethics,

Is it right if few people are killed or animal life is affected or harmful radiations are released in environment to assure you the security of nation of millions or billions of people? - A point of debate

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So, mapping this with the utilitarianism ethics so, it is right if few people are killed or animal life is affected, or harmful radiations are released in environment, to assure you the security of the nation of millions and billions of people. So, again it is unlike whether we are looking for compromising on the lives of a few people, or animal lives or the environment to give bringing happiness to the maybe millions, or billions of people the majority.

But again debatable question is can we really compromise for the life of a particular entity and, like sure and then it is taken as a cost for the buying the may be happiness for a at the million. So, can we really to that is again a question of debate all we need to like, take measures enough to see that this harm is minimized, or can we avoid this harm at all.

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From the theory of deontology,

Deontology focuses on whether the action is right or wrong instead of analyzing the consequences.

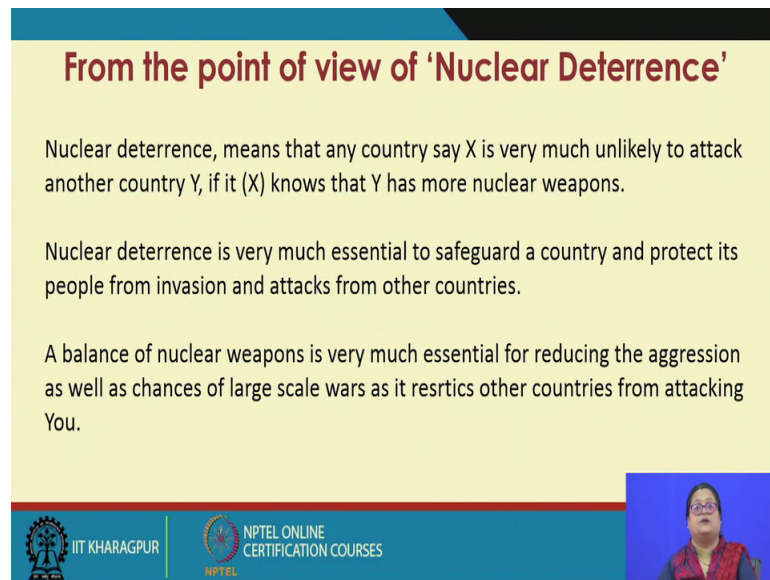
As nuclear weapons often claim innocent lives in both the opponent and retaliatory countries at risk, then it too is intrinsically wrong

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From the theory of deontology that is the duty ethics. So, it focuses on whether the action is right, or wrong instead of analyzing the consequences. So, as nuclear weapons claims the lives of some innocent people both in the opponent and in the retaliatory countries at risk. So, it is to intrinsically wrong, because the nuclear weapon, it is claiming some innocent lives who are nowhere connected with the main issue for which nuclear weapons are getting fired. So, maybe they are not involved in the decision process so, but they face the consequences.

So, that consequence is claiming the lives of the people. So, whether they are operant or not and so, based on that this is taken to me and intrinsically wrong to like, go for nuclear weapons and without trying to find out maybe if other alternatives are available or not.

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From the point of view of 'Nuclear Deterrence'


Nuclear deterrence, means that any country say X is very much unlikely to attack another country Y, if it (X) knows that Y has more nuclear weapons.

Nuclear deterrence is very much essential to safeguard a country and protect its people from invasion and attacks from other countries.

A balance of nuclear weapons is very much essential for reducing the aggression as well as chances of large scale wars as it restricts other countries from attacking You.

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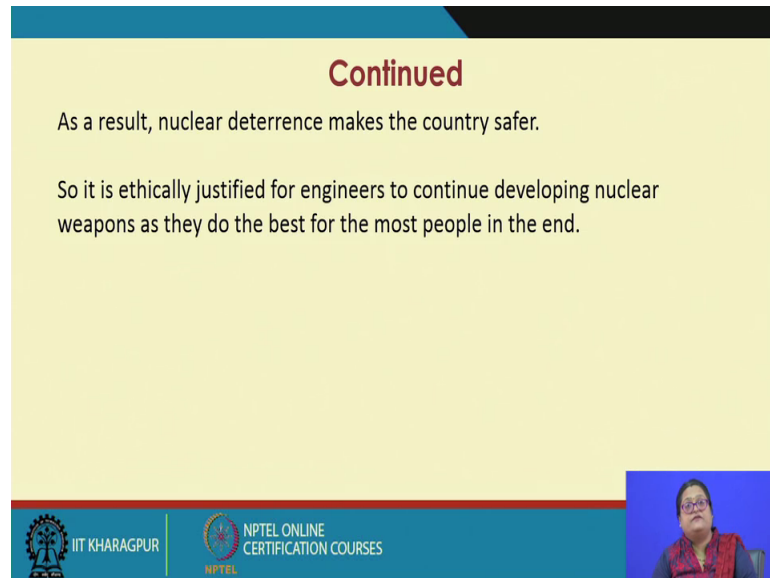


From the viewpoint of nuclear deterrence, we can tell like determines avoiding. So, nuclear deterrence like if country X views like the country Y if nuclear deterrence means like, if the country X is very much unlikely to attack country Y, if it feels like the or if it knows like the country X has more nuclear weapons. So, if the country Y has made itself strong by getting more nuclear weapons, that may give a threat perception to others and they will not be planning to attack country Y.

So, nuclear deterrence is very much essential to safeguard a country and protects its people from invasion and, attacks from other countries. So, taking this into consideration, a balance of nuclear weapon is very much essential. For reducing the aggression as well as chances of large scale wars as it restricts other countries from attacking you.

So, if I portray my image if my image gets projected to other organizations of the one countries images like, that is a very nuclear weapon strong country is getting, projected to the other countries they may not be attacking us and that is how we safeguard ourselves; so, taking this into consideration. So, it having a balanced nuclear weapon is maybe necessary. So, that people we do not have like too much like which is a questionable and we do not have anything. So, that we do not have the power to safeguard ourselves also. So, balanced term nuclear weapon is like essential.

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As a result, nuclear deterrence makes the country safer.

So it is ethically justified for engineers to continue developing nuclear weapons as they do the best for the most people in the end.

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So, for that we can conclude like nuclear deterrence makes the country safer. So, it is justified for engineers, to continue developing nuclear weapons. So, as they do it for the as they do the best for the most people do in the end. So, what we can conclude over here yes, we can continue developing nuclear weapons, we can try out with nuclear equipments, because as a part of nuclear deterrence is important to us from this point of security of the country.

Likes to stop other countries from attacking us, it is better to have some something with us which like stops other people from countries from attacking us, because they know if I have the weapons I can like use it at any point of time. This is very much true the other fact is also very true, now what is that other fact, because we have the power, because we have the nuclear weapon, because we are strong in it, we cannot misuse it, we have to understand the consequences of it we have to understand the long term effect, not only on the present generation, but on the future generations to come that the nuclear weapons we have.

And it is a part of the responsibility of the government and the alliances the nuclear weapon manufacturers everyone connected to it. To find, to understand, to realize like yes we may be possessing certain you weapons, but possessing certain weapons does not mean, like we have to use it as an like very casually.

Without trying to find out whether other alternatives are possible or not, whether we can do it in a different, whether we can arrive at certain outcomes, whether we can whether we can go for a certain outcomes, peacefully like or a decision jointly taken respected, where we keep to our words where the integrity of the people are maintained they do not walk out from their promises and follow it.

So, there will be many traps many greed's again, because we have the weapon because we have the power why not just use it and test it. So, that others get to realize our power, but the power also lies in power also lies in self discipline, power also lies in having a control on oneself like you having power does not always mean like you need to show that power to others to appear powerful.

So, having a self control on oneself taking a positive decision towards, how we can lead a peaceful life, how we can manage our country in a peaceful way, with the we may be having the weapons we may be having the equipments, but it does not mean we need to like use it time and again often, to show that we have that power. We can if we really want to find out other ways of running the country in a peaceful way without raising the weapons.

In terms of other equipments we have to definitely see: what is the benefit that is given by this equipments and what are the corresponding harm provided, in order to bring some benefit to the human, we cannot provide harm to the animals and to the environment at large. So, whose benefit are we talking of how is it is it going to bring like sustainability throughout the generations are we ignoring the rights of the animals to survive.

Are we disturbing the ecological balance while we are talking of using these nuclear weapons should be questions, which should be visited revisited again and again, with a self check to find out answers like to is this really required, or there could be other alternatives also. If we find like yes it is really required, then what are we doing to arrest for the harm that we are providing to the animal world to the equal to the environment at large, to the future generations of these human and the animal world to come and the environment pollutions to be or the depletion to be reduced.

So, what are we doing for it to balance it. So, balanced approach is very much essential from the utilitarian perspective, understanding ones duties towards and responsibilities of

using these equipments and weapons, is also very important focus from the deontological perspective with respect to nuclear ethics.

Thank you.