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Chernobyl Nuclear Disaster and its impact on American and British popular culture

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Prohlašuji, že jsem práci zpracoval(a) samostatně a použil(a) jen uvedených pramenů a literatury.

Plzeň, duben 2018 ……

1. Introduction

This thesis deals with influences of Chernobyl accident on British and American popular culture. Its main goal is to provide reader with a list of notable works-of-art, influenced by Chernobyl accident, which were either produced by British or American authors or gained recognition in those countries.

The chapter History contains a historical and geographical background of the Disaster, a detailed, timed description of events leading to explosion and of events ensuing after the initial explosion. It then focuses on measures taken to battle the radiation and eventual restoration process. Next part of this chapter provides extensive information on the effects and both short-term and long-term consequences of the disaster on politics, human health, environment and nuclear energy. The last part deals with gradual changes in the Zone and its state today. The information for this part was gathered from official online sources, such as: World Health Organization and World Nuclear Association and various other electronic articles and theses.

The list of works by British/American authors is sorted by the type of medium (Literature, Movies, Visual art, Videogames and Jokes/Memes) each category is sorted further into non-fictional and fictional categories (in literature and movies). Individual entries are sorted by the date of publishing from the eldest to the most recent ones. Entries contain basic data and brief description of the work or its author. Mentions of notable works by foreign authors are included. The entries and information provided in this part are sourced from online international databases, such as: Amazon.com, Goodreads.com, IMDb.com and ČSFD.cz for Czech works.

The last part contains a short list of notable works by Czech authors and comments on the effects of Disaster on Czech society and Czech popular culture, based on the related survey, with full presentation of its results.

The survey is bound to give comparative base for answering main concerns of this thesis. These are: Which aspects of the Chernobyl Nuclear Disaster were prevalent in the works of British and American popular culture throughout time and which influences are still relevant today? What is the position of The USA and The UK regarding the worldwide production of popular goods? Are there noticeable differences between influences shown in British/American popular culture and influences shown in other parts of Europe?

2. History

2.1. Significant places

2.1.1. Chernobyl Raion

Chernobyl raion was one of 26 administrative districts of the Kiev region in northern Ukraine. It was established in 1923 as part of the Kiev Governorate, following the administrative reorganization of the Ukrainian Soviet Socialist Republic. Its administrative center was town of Chernobyl. In 1941, the town's status was changed to a city of district significance [1](Chornobyl Raion: History, 2014).

The district bordered with the Kiev Reservoir on the east side. To its south it bordered with the Kiev-Sviatoshyn Raion; to the southwest with the Ivankiv Raion; and to its west with Belarusian district Polesia. Significant portions of these districts suffered from the fallout caused by Chernobyl disaster.[2]

The river Pripyat flows through its territory. Prior to the accident, the Chernobyl Raion had an area of 2,000 km^2 (770 sq mi) and a population of 44,000 inhabitants in over 70 populated places.

On 16 November 1988 the Chernobyl Raion was dissolved and officially merged with the Ivankiv Raion in decree of the Presidium of the Supreme Soviet of the Ukrainian SSR [3](Chornobyl Raion: History, 2014).

2.1.2. The Chernobyl Nuclear Power Plant Zone of Alienation

Also known as The Zone of Alienation, the Chernobyl Exclusion Zone or simply The Zone [4](Life exposed: biological citizens after Chernobyl, 2002).

The Exclusion zone was established soon after the accident on 2 May 1986, having 30 km in radius. The Zone was initially divided into three subzones: the area adjacent to Reactor 4, an area of approximately 10 km in radius from the reactor and the remaining 30 km zone. It is managed by an agency of the State Emergency Service of Ukraine, while the power plant and its sarcophagus (and replacement) are administered separately.

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[1] Chornobyl Raion: History. www.tribunapraci.com.ua [online]. Ukraine, Ivankivskij raion: Trybuna Pratsi, 2014, 14 April 2014 [cit. 2018-03-23]. Available at: http://tribunapraci.com.ua/arhiv/25401-chornobilskij-rajon-lruxlivar-storya.html

[2] (See appendix 1).

[3] ibid

[4] PETRYNA, Adriana. Life exposed: biological citizens after Chernobyl. Princeton, [N.J.]: Princeton University Press, 2002. ISBN 9780691090191.

The Zone borders with Belarusian Polesia State Radioecological Reserve in the north.[5] The Exclusion Zone is fully evacuated except for personnel stationed temporarily in Chernobyl and a small number of self-settlers who returned there illegally, but were eventually permitted to stay (see 3.4.1.). The Zone was proclaimed as a Tourist site in 2011. About 50 different agencies offer guided tours along The Zone, which range from 1 day to several days of stay [6](Chernobyl record: the definitive history of the Chernobyl catastrophe. 2000).

2.1.3. City of Chernobyl

Is a city in the restricted Chernobyl Exclusion Zone, situated in the Ivankiv Raion of northern Kiev region. It is located about 90 kilometres northeast of Kiev and approximately 140 kilometres southwest of the Belarusian city of Gomel. The city was the administrative center of Chernobyl Raion (district) from 1923 until it was disestablished in 1988. Before its evacuation, the city had about 14,000 residents.[7]Chernobyl record: the definitive history of the Chernobyl catastrophe, 2000). The city was evacuated on 27 April 1986; 30 hours after the Chernobyl disaster at the Chernobyl Nuclear Power Plant (see 2.2.3. for details)

As of 2017, the city has a population of approximately 690 inhabitants. Chernobyl is partially a ghost town. Only small number of people stays there for a longer period. Most of the current population are border control workers on watch, administrative personnel of the "Zone of Alienation" and researchers, who stay there for maximum of 15 days before leaving for 2 weeks. There are two general stores, a post office, laboratories, medical facility and two hotels (Hotel "Pripyat" and Hotel "Desiatka") for tourists [8](Babushkas of Chernobyl, 2015).

2.1.4. City of Slavutych

Is a city in northern Ukraine built specifically for the evacuated personnel of the Chernobyl Nuclear Power Plant and inhabitants of Prypyat and Chernobyl after the 1986 disaster. Slavutych is administratively subordinated to the Kiev region as a town of district significance. As of 2014, the city had a population approximately of 25,000 inhabitants. It is an administrative exclave, not belonging to any raion[9](http://oblstat.kiev.ukrstat.gov.ua).

The city is situated on the left bank of the river Dnieper, 50 kilometres from Chernobyl and 200 kilometres from Kiev (see appendence 1). Slavutych was named after the old Slavic name

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[5] (See Appendix 2)
[6] MOULD, Richard F. Chernobyl record: the definitive history of the Chernobyl catastrophe. Philadelphia, PA: Institute of Physics Publishing, 2000. ISBN 075030670X.

[8] *Babushkas of Chernobyl* [movie], directed by A. Bogart, H. Morris, [USA]: 2015
[9] Исельність населення (за оцінкою) на 1 січня 2017 року. http://oblstat.kiev.ukrstat.gov.ua [online]. Kiev: Головне управління статистики у Київській області, 2006 [cit. 2018-03-23]. Available at: http://oblstat.kiev.ukrstat.gov.ua/content/p.php3?c=114&lang=1

for the Dnieper River. Construction of this purposely-built city began in 1986 and its first residents arrived in October 1988 [10](www.meganstarr.com, 2014).

Slavutych was the last city build by the Soviet Union and it is the youngest city in Ukraine to this day. The site had to be chosen a reasonable distance away from the Chernobyl Zone to ensure that risks related to further radiation exposure were minimized. Among other decisive factors were the availability of a nearby railroad infrastructure and an accessible water supply from the Dnieper River. In order to build the city, the ground had to be covered with a two-meter layer of uncontaminated soil first.

The city had to be built as fast as possible and thus it is constructed in a very different manner from the other cities of the Soviet Union. Workers and architects from eight Soviet countries joined forces to build his city. Each country representant built a district of the city in their typical and traditional architecture. These districts, or quarters, were named after the capitals of each country.

The city was proclaimed Special Economic Zone since most of its residents lost their jobs at the nuclear power plant by 2001. About 3,800 are still employed at the Chernobyl power plant, but other residents had to be retrained and employed elsewhere. This economic situation carries a number of negative effects and is also strengthened by an uncertain future of power plant workers after the sarcophagus is fully finished [11](www.meganstarr.com) (see 2.3.2. for details).

2.1.5. The Chernobyl 2

This structure is 1 of 3 top secret over-the-horizon radar stations used for detection of missiles during the Soviet era. It is located 10 km south of Chernobyl nuclear power plant. It was built as a last of its kind in 1970 and intended to monitor Europe and part of North America. Part of this station was a small town intended for radar garrison of approximately 1000 people and their families.

It was nicknamed the "Russian Woodpecker" for sound it started emitting sometime around 1976 while interrupting short radio waves due to high frequencies it used, The noise was recognizable in radio transmissions all over the world.

At present the radar is not in use by any government and is frequently visited by tourists in The Zone 12(www.chernobylwel.com).

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[10] A second life for the inhabitants of Chernobyl. Www.cafebabel.co.uk [online]. Babel International, c2007-2013, April 24 2014 [cit. 2018-03-23]. Available at: http://www.cafebabel.co.uk/article/a-second-life-for-the-inhabitants-of-chernobyl.html

[11] ibid

[12] Chernobyl 2 - Russian Woodpecker | Chernobyl Blog. New 2018 Chernobyl Tours: Top on Tripadvisor | CHERNOBYLwel.come | chernobylwel.com [online]. Copyright © CHERNOBYLWEL.COMe 2013 [cit. 26.03.2018]. Available at: https://www.chernobylwel.com/blog/chernobyl-2/

2.1.6. City of Pripyat

Its construction began in 1970 and was still ongoing in 1986 at the time of disaster. *It was* a settlement built for construction workers and Chernobyl power plant staff. It also had the status of so called "closed city", meaning inhabitants and visitors were obliged to have access permit. Officially called "atomgrad" (the city of nuclear scientists and workers) it was 1 of 9 such cities in Soviet Union.

Branded as a model modern Soviet city, built on blank space, its infrastructure, layout and facilities were the top tier of its time. Living there was in high demand; city became a tourist attraction and inspiration for architects all around the USSR. It also served as an important junction and the main staging post for the whole of Polesie (region). Being equipped with railway, highway and even water ports.[13] (https://archive.is). Sources of information on the town population at the time of disaster vary greatly, ranging from 45 000 to 50 000 inhabitants.

At the time of disaster, people and even the highest authorities were unaware of what happened exactly and thus vastly underestimated the danger of exposure to radioactive cloud. No protective gear or materials such as iodine pills or gas masks were issued in the first night and day of disaster and no restrictions were placed either. Evacuation of Pripyat took place on the afternoon of April 27, 1986. Official information given to inhabitants was misleading regarding the purpose, to avoid large scale panic and unnecessary luggage. Over 1000 buses were set to transport people to safety.

During the years after there were some attempts to restore life in Pripyat, but gradually the officials decided that city will not ever be inhabitable again. Partly because of damage caused naturally and partly because of damage caused by plundering, this became even more prevalent after the fall of USSR in 1991. Today the city is regarded as a "ghost town", has zero population and is located in restricted 10 km exclusion zone [14](Battle of Chernobyl, 2006).

2.1.7. Chernobyl nuclear power plant

It is also known as the V.I. Lenin Nuclear Power Station or the Chernobyl Nuclear Power Station. Its construction began in 1970 together with the construction of the city Pripyat and the object Chernobyl 2.

It was equipped with four RBMK-1000 reactors in 1986, each capable of producing 1,000 megawatts (MW) of electric power. These produced about 10% of Ukraine's electricity at the time of the disaster and were considered the most modern type of reactor available in the USSR. Two more RBMK reactors were under construction at the time of the accident (5th

13 Pripyat: Short Introduction - City|Visiting - card. Materials about: Pripyat, Chernobyl accident. Webpage archive [online]. Copyright © 2005 [cit. 26.03.2018]. Available at: https://archive.is/20120711234726/http://new.pripyat.com/en/city/visiting-card/2005/07/28/230.html

14 The Battle of Chernobyl, [movie], directed by Thomas Johnson, [France]: Discovery Channel, c 2006

and 6th)[15] (http://www.world-nuclear.org). Their construction was suspended and in 1989 fully cancelled [16](http://articles.latimes.com).

Reactors 1-3 continued to operate after the disaster. Reactor N. 2 was permanently shut down in 1991 after a fire broke out due to a faulty switch in a turbine.
Reactors 1 and 3 were eventually closed as a part of an agreement Ukraine made with the EU in 1995, in which Ukraine agreed to close the remaining units in exchange for EU assistance in modernizing the shelter over reactor No. 4 and improving the energy sector of the country. Reactor No. 1 was shut down in 1996 with No. 3 shutdown following in 2000 [17](http://www.world-nuclear.org).

2.1.8. Chernobyl New Safe Confinement

Is a new steel containment structure, which was built to replace the aging and hastily built sarcophagus, which protected Reactor No. 4. Announced in 2003, its construction was delayed several times and officially began in September 2010.

The New Safe Confinement was financed by an international fund managed by the European Bank for Reconstruction and Development (EBRD) and was designed and built by the French-led consortium Novarka [18](www.theengineer.co.uk, 2018). This new sarcophagus is a giant arch-shaped structure made out of steel, 270 m (886 ft) wide, 100 m (328 ft) high and 150 m (492 ft) long to cover the old concrete dome that is currently in use. This steel casing project was expected to cost 1.4 billion USD, and was completed on 29 November 2016. It was designed with the primary goal of containing the radioactive remains of Reactor 4 for the next 100 years and to allow for a future partial demolition of the original sarcophagus. It is the world's largest mobile metal structure [19](http://chernobylgallery.com).

2.2. The Accident

2.2.1. Premise

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[15] World Nuclear Association - World Nuclear Association [online]. Available at: http://www.world-nuclear.org/information-library/safety-and-security/safety-of-plants/chernobyl-accident.aspx#ECSArticleLink0
[16] Soviets Cancel Plans for 2 New Reactors at Chernobyl - latimes. Featured Articles From The latimes [online]. Available at: http://articles.latimes.com/1989-04-21/news/mn-2182_1_chernobyl-nuclear-power-station-new-reactors-western-reactors
[17] Early Soviet Reactors and EU Accession - World Nuclear Association. World Nuclear Association - World Nuclear Association[online]. Copyright © 2016, 2017, 2018 World Nuclear Association, registered in England and Wales, number 01215741. [cit. 29.03.2018]. Available at: http://www.world-nuclear.org/information-library/safety-and-security/safety-of-plants/appendices/early-soviet-reactors-and-eu-accession.aspx
[18] Arches of Chernobyl's New Safe Confinement are joined together - The Engineer The Engineer. The Engineer - News and analysis from the world of engineering The Engineer [online]. Copyright © 2018. All rights reserved. [cit. 29.03.2018]. Available at: https://www.theengineer.co.uk/issues/august-2015-online/arches-of-chernobyls-new-safe-confinement-are-joined-together/
[19] New Safe Confinement | The Chernobyl Gallery. Chernobyl Gallery [online]. [cit. 29.03.2018]. Available at: http://chernobylgallery.com/chernobyl-disaster/new-safe-confinement/

The personnel of 167 men, working at the V.I. Lenin nuclear power plant, were conducting a test of a new self-fuelling system of the reactor, a measure taken to save energy in the future. It was being done in a framework of scheduled routine maintenance shutdown.

2.2.2. The Beginning

26 April 1986 at 2:23 A.M. – the automated security systems were deactivated and the simulation of a station blackout power-failure began.

Unfortunately, the test was carried out without a proper exchange of information and coordination between the team in charge of the test and the personnel in charge of the safety. Therefore, inadequate safety precautions were taken in the test programme and the operating personnel were not aware of potential danger.

This, combined with inherent reactor design flaws, and actions taken in contrary to the checklist for the test, eventually resulted in the reactor becoming unstable. Water flashed into steam, generating a destructive steam explosion. 1200 ton metal cover of reactor blasted into the air, resulting in the emission of highly radioactive vapour, uranium and graphite into the atmosphere and subsequent open-air graphite fire. Steam-blast effects caused two deaths within the facility [20](world-nuclear.org, 2018).

A fire brigade was sent out to extinguish fire on the roof, but were initially unable to cool the core properly with water (which was another source of later complications). None of them were equipped with proper protection gear and thus majority of them died of acute radiation poisoning in matter of few weeks or months, 2 of them died right after the operation. They were later rewarded as Heroes of USSR. The main roof fire was put out around 5:00 A.M. The fire inside reactor 4 continued to burn until 10 May 1986.

Approximately 5:00 A.M. – Mikhail Gorbachev, the First secretary of the USSR, is alerted by phone that an accident occurred in the Chernobyl power plant, fire was put out, but he was not given any exact information about the nature of accident or information about the explosion.

Igor Kostin, a photographer from news agency Novosti, was the first person to document the burning reactor, while flying over the area in a helicopter. While circling around the block, he opened the window to have better sight, unaware of danger it posed. His cameras were dysfunctional in matter of minutes and all pictures and film were damaged by radiation. He is one of the few journalists who survived reporting the early days of accident.

Moscow 10:00 A.M. – Government still has only scant information about the situation and was being assured that everything is safe and sound, and reactors could not have failed. No official information was released to the public. Army and police patrols were sent to survey

[20] Chernobyl Appendix 1: Sequence of Events - World Nuclear Association. World Nuclear Association - World Nuclear Association [online]. Copyright © 2016, 2017, 2018 World Nuclear Association, registered in England and Wales, number 01215741. [cit. 29.03.2018]. Available at: http://www.world-nuclear.org/information-library/safety-and-security/safety-of-plants/appendices/chernobyl-accident-appendix-1-sequence-of-events.aspx

and secure the area. The dosimeters available at the time were claiming extreme amounts of radioactivity, but it was assumed they are faulty. [21](The Battle of Chernobyl, 2006)

April 27 - Colonel of this operation, Vladimir Grebeniuk, sends first troops to survey the immediate surroundings of block No. 4, results of these measurements are discussed at Kurharov Institute. It was the first time ever such high amounts of radioactivity were documented.

Gorbachev established a governmental commission made of country's top experts on nuclear energy, lead by well-known physicist Legasov. The commission studied situation from town of Pripyat, but were unable to provide correct information for days.

2.2.3. First steps

Afternoon April 27 - An evacuation order was issued; inhabitants of Pripyat were given 2 hours to prepare for departure. Pets and domestic animals had to be left behind. The official statement was that the evacuation will take only 3 days, to avoid large-scale panic and unnecessary luggage. The authorities were sure these people are leaving for much longer and eventually inhabitants have never returned.

Certain inhabitants, mostly elderly people, chose to stay behind, being unaware of the danger and not believing that something they cannot see might harm them [22](The Babushkas of Chernobyl, 2015).

All of 43 000 Pripyat inhabitants were peacefully evacuated by buses in less than 4 hours. All of them had to undergo health checks in hospitals, since the dose of radiation they have received was approximately 50 times higher then allowed (healthy) limits. This level of poisoning alters composition of blood and leads to fatal cancers. Most of these people were temporarily stationed in Kiev and other large cities, eventually they were moved to new-built city of Slavutych. (see 2.1.4. for details)

48 hours after the accident – Only military personnel and scientific delegation were present in the Chernobyl area. Even these specialists had taken only limited precautions and continued to endanger themselves by eating and drinking out in the open, underestimating the severity of situation. There were certain criteria based on other similar events, which were being followed, but they proved to be highly inefficient and outdated. Some of them even assumed that reactor will be back in service by June [23](The Battle of Chernobyl, 2006).

By this time (50-60 hours after the accident), the radioactive clouds were spreading quickly, over the northeast of Europe (Eastern Russia, Baltics, Belarus and Poland). By the 28 April these fumes arrived to Scandinavia, Sweden. The Swedish were first to measure unusually high amounts of radiation in the air and immediately broadcast the news on the main TV channel. After excluding their own power plants as a source of contamination, Swedish

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[21] *The Battle of Chernobyl*, [movie] Directed by Thomas Johnson, Francie Discovery Channel, c 2006
[22] *The Babushkas of Chernobyl* [movie], Directed by Anne Bogart, Holly Morris, USA, 2015
[23] *The Battle of Chernobyl*, [movie] Directed by Thomas Johnson, Francie Discovery Channel, c 2006

officials contacted Hans Blix, the Director of International Atomic Energy Agency and reported results of their measurements and all available data.

The agency had no knowledge of any accident, but was ready to contact all countries in the Eastern Europe, including the Soviet Union, to obtain necessary information.

Soviet government was provided with proper information from abroad, after disclosing that something has happened in Chernobyl and according to Mikhail Gorbachov, "*It was the first time they knew exactly what was going on"*. This information was confirmed by European and American spy satellites and intelligence. Although some historians claim that the USSR only tried to keep the accident secret and were well aware of what happened. (see 3.1.2.)

The official public worldwide announcement from the Soviet Union came after USSR confirmed the situation to the Hans Blix on 28 April. Gorbachev demanded all the information available to KGB to be given to him personally and to record the meetings held by scientist in Pripyat.

The damaged reactor was still burning and the situation reached a critical point. On the third day of accident, General Antochkin was in command of 80 helicopters, sent from Moscow to extinguish the reactor.

Temperatures in 200 metres above the reactor ranged from 120 to 180 °C, and radiation was estimated to be around 1000 Roentgens, meaning that about 30 minutes of exposure would be lethal. The extensive heat made it impossible for helicopters to stay right above the reactor.

Reactor needed to be cooled down and sealed off, in order to stop emitting radioactive particles and to allow further actions. Best pilots were called back from Afghan front to take part in this operation. General Antohkin devised a plan: from each helicopter flying by; soldiers would drop 80kg sandbags and boric acid into the reactor to neutralize the radiation, enduring extreme heat and radiation, which resulted in most of them being hospitalized and later killed by radiation poisoning [24](The Battle of Chernobyl, 2006).

1 May 1986 – 1 May was a significant public holiday in the USSR, with mostly mandatory parades all over the place. By this time the winds shifted and radioactive cloud moved over the Kiev. Soviet government left citizens mostly uninformed, and released the information cautiously, altered and downplayed. This eventually led to thousands of people being exposed to radiation, only because of disinformation and secretiveness of their own government. Official photos from this event were later removed from archives.

1 – 2 May- Inhabitants of City of Chernobyl and villages in 30 km radius were evacuated. The Exclusion Zone has been established. Radioactive cloud moved over to France and spread to the UK and Greece, contaminating crops, French government refused to acknowledge this information and act on it.

Hans Blix is invited to visit the Chernobyl site. He is the first foreigner to do so.

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[24] ibid

2.2.4. New danger

The first attempt to lower radiation carried out by General Antochkin covered up the reactor, but radiation levels were still increasing, as a result of graphite and uranium reacting underneath the cover, which also acted as a "plug". This situation proves to be critical and an imminent danger (from possible contact of hot uranium/graphite mixture with water pooled underneath slabs) of explosion, which would render large part of the Europe uninhabitable, ensues. Estimated force of explosion was 3 to 5 megatons.[25] (Battle of Chernobyl, 2006)

Means of transportation for potential evacuation of Minsk, Kiev and Gomel were ready.

Moscow decrees two emergency measures:

1. Send a fire brigade to remove pooled water from underneath the reactor.
These men would suffer from radiation disease for the rest of their lives and they were all regarded as national heroes

2. Seal the breach more effectively to lower the temperature inside the reactor
This was done by Antochkin's men, who dropped 2400 tons of lead into the pit. This resolution proved to be efficient, but had other severe consequences. Some of lead vaporized and was released into atmosphere, its traces could be found in inhabitants (children) of this area 20 years after the accident.

The fire brigade and 600 pilots were lethally contaminated during this operation. And this operation gained them only few weeks of extra time. [26](Battle of Chernobyl, 2006)

This was later harshly criticized, but according to Gen. Antochkin, *"This was the best solution regarding the short time we had to resolve the crisis, it had to be done" Everyone worked selflessly, this was heroism*"[27](Battle of Chernobyl, 2006)."

11 May 1986 - Authorities decided that a delegation of technicians and scientists from Kurchov Institute needs to get closer to the reactor, using the cable and pipe tunnels, to gather necessary information. They confirmed that substance cracked the concrete and descended through to the empty basin. If the substance had continued to seep into soil, it would have contaminated groundwater sources and eventually all water sources in Ukraine and further [28](The Battle of Chernobyl, 2006).

12 May 1986 - New operation was launched. Deputy Minister of Mining Industry decided to send miners from Moscow basin into the Zone. After 24 hours they were already working on their mission: To create a 150 metres long and 30 metres wide tunnel, leading under the reactor No. 4, which would enable installation of cooling devices under the concrete slabs. To avoid radiation, the tunnel was built 12 metres underground and groups of miners switched

[25] ibid
[26] ibid
[27] ibid
[28] ibid

every 3 hours, to avoid exhaustion form extreme conditions. In total 10 000 men were sent to take part in this operation.

Due to extreme working conditions in the tunnel (no ventilation, heat, fast pace) workers stopped using gas masks, drank water out in the open and ignored other safety precautions while outside. Many of them became later victims of radiation poisoning, and ¼ of them died before the age of 40. Others suffered from radiation illness their whole life, since the doses they had acquired were 5 times greater than what the Authorities claimed in official documents. These victims were never included in the final death statistics of the Accident.

During this operation Hans Blix organised an official press conference in Moscow and disclaimed, that International Nuclear Energy Agency and Soviets arranged to meet at Vienna and perform a public post-accident analysis. Soviets agreed to share all available information.

According to Hans Blix, this decision had a decisive effect on the political rise of Gorbachov and his government. It was percieved as a sign of trustworthiness and willingness to cooperate with The West. This eventually boosted Gorbachov's "Glasnost" policy and other proposed changes in the regime and led to the successful end of The Cold War.

14 May 1986 – First large-scale public statement regarding the accident is broadcast on national TV.

17 June 1986 – the tunnel and device room are finished. Such operation would normally take around 3 months. Unfortunately, the cooling device is never installed and the room is only filled with concrete to reinforce the structure.

The imminent danger is averted and operations aimed to start restoration of the area and lower the radioactivity levels. [29](Battle of Chernobyl, 2006)

2.3. Restoration Process

2.3.1. The liquidation of the Chernobyl accident

Everyone capable of help had been mobilized, no matter the costs or formalities. General Nikolai Tarakanov was in charge of troops, operating in the Zone. In his words, approximately 100 000 soldiers, officers and mainly reservists were involved in these operations in the course of one year. The total number of people involved is estimated to be around 500 000 men (including administrative and medical personnel).

These men were later called "liquidators". Their task was to lower the radiation levels and keep the radiation from spreading. This involved watering down the radioactive dust from buildings, crops, pastures and streets, removal of all wild and stray animals, by special hunting brigades and using helicopters to spread dust-settling liquid called "burba" on forests and mountains.

[29] ibid

Igor Kostin and his crew were the only reporters allowed to record the operation, but these materials were not released until many years later. According to survivors, workers and personnel were issued rations of vodka and iodine pills to battle the radiation. They were fed well, and most of them enjoyed their stay.

The last people staying in remote villages were evacuated, their houses razed and rubble buried under ground. Total of 70 settlements were erased from the existence.

The largest operation of the restoration process was dealing with contaminated soil around the reactor No. 4. 300 000 m^3 of soil was bulldozed into deep ditches and cover with layer of concrete [30](The Battle of Chernobyl, 2006).

2.3.2. The sarcophagus

8 weeks after, plans on isolating the damaged reactor are being set in motion. The enormous structure made of steel and concrete, supposed to cover the entire reactor, later known as "the sarcophagus" is architected and its parts are made in different factories all over the country. The subsequent construction lasted for 206 days.

The biggest issue at hand for the liquidators was the extreme radioactivity in the close proximity of the reactor. A person was able to work there only for mere minutes at time without receiving a lethal dose of radiation.

Parts of sarcophagus were being delivered at the site and assembled as quickly as possible. They had to be made with extreme precision, to fit into each other. Authorities decided to use remotely controlled robots to screw and weld the sarcophagus' parts together. People stationing them at the site were transported in armoured vehicles, covered in plates of lead. Parts were placed with the help of DEMAC 4000 Cranes. [31](The Battle of Chernobyl, 2006)

When builders reached the upper parts of building, the highly radioactive graphite covering the roof reactors No. 3 and No. 4, appeared to be a great issue. It needed to be removed. (Estimated radioactivity of pieces ranged from 500 roentgens to 1500 roentgens, taking only an hour of exposure for a human to be lethally contaminated.)

Robots were used in initial parts of this step. Some were throwing the debris down; others were gathering it and placing into pitches, which were later sealed. Unfortunately, the radiation was too high for their electronics to function properly and their circuits were damaged, rendering them dysfunctional in matter of days.

Authorities decided to deploy Soviet soldiers, later nicknamed the "Biorobots", to clean the remaining waste. The battalion consisted of reservists, mostly young civilians sent to take part in this operation. They were dressed in special suits, covered in lead plates and wore other protective gear to, be safe while outside. The full gear weighted around 30 kilograms.

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[30] ibid
[31] ibid

Soldiers worked in groups of 8 people, staying exposed only from 40 seconds to 3 minutes, depending on radiation levels, before they retreated and were replaced by another group
Total of 3 500 people participated in this step. The operation took 2 weeks to finish.

7 months after the explosion The Zone was deemed as "cleaned up" and the sarcophagus was finished. As a symbol of victory and as a tribute to all participants, a Soviet flag had been placed on top of the sarcophagus. Its longevity was estimated to be 20-30 years, after measures had been taken to avoid collapse of one of the walls, by Soviet scientists in 1988. [32](The Battle of Chernobyl, 2006)

2.3.3. Years after

The first international competition for creating a project capable to replace the original sarcophagus was held in 1992. Out of the 394 entries, only the British proposed a sliding arch approach.
Years later, a pan-European study (the TACIS programme) re-examined the proposals of the top three finalists. The study selected the sliding arch proposal as the best solution.

In 1996, the sarcophagus was deemed impossible to repair, due to prevailing high levels of radiation in its proximity [33](Proceedings Of the Institution of civil engineers,1997).

On 17 September 2007 Vinci Construction Grands Projets and Bouygues Travaux Publics won the competition for constructionof the New Safe Confinement as 50/50 partners of a French consortium Novarka. This project was finished on 29 November 2016 [34](www.vinci.com, 2017).

3. Effects of Chernobyl disaster

3.1. Politics

3.1.1. The Background

Mikhail Gorbachev, The General Secretary of CPSU (Communist Party of Soviet Union) was the leading figure of Soviet politics in 1986. He was the eighth and last leader of the Soviet Union and is regarded as a significant reformist. Among his most well known reforms are:

"*Perestroika*"(restructuring) and *"Uskoreniye*" (acceleration) programmes – designed to revive and restructure Soviet economy, lower bureaucracy and improve well-being of its citizens.

[32] ibid
[33] Proceedings Of the Institution of civil engineers. London: Thomas Telford, 1997. ISSN issn0965-089x.
[34] VINCI and Bouygues Construction sign contract to build containment shelter for the Chernobyl sarcophagus (17/09/2007) - Press releases - Media [VINCI]. VINCI, acteur mondial des métiers des concessions et de la construction [VINCI] [online]. Dostupné z: https://www.vinci.com/vinci.nsf/en/press-releases/pages/20070917-1342.htm

"*Demokratizatsiya*" (democratization) policy in the framework of "*Perestroika*" - aimed to reform his stagnating political party and political system, which he saw as necessary to enable effective reforms in other areas

"Glasnost" (openness) – Introduced in 1988, it resulted in improved freedom of speech, and thousands of political prisoners and many dissidents being released. The censorship of media prevailed till the collapse of USSR in 1991.Gorbachev's goal was to pressure conservatives within his political party into supporting his economic policies. He also hoped, Soviet people would support his reform initiatives, by perceiving this new openness to public criticism as a sign of trustworthiness. This openness also strived to improve relationship with capitalist countries [35](Milestones in glasnost and perestroika, 1991).

3.1.2. Effects of Chernobyl on Glasnost

Gorbachev's efforts to present his new government as a reasonable, accountable government, focused on transparency in politics, were greatly challenged by The Chernobyl accident. The scarcity of information given to people directly affected by fallout and delay in reporting the accident to the rest of Soviet citizens and neighbouring countries had an adverse impact on regime's credibility.

Initially reacting with traditional secrecy and then altering the amount and type of information given to people even months and years after the Accident, has led to harsh criticism of top officials by both Soviet and Western press.[36](The Chernobyl's accident, 2012)

According to Mikhail Gorbachev himself, government did not have much information at disposal in the beginning and were not fully aware of dangers and reach of the situation. The blackout on information was also imposed to avoid large-scale panic [37](The Battle of Chernobyl, 2006).

Once the Soviet regime saw consequences of secretive approach, it exploited the situation to push the "Glasnost" agenda, using the situation to demonstrate the effect of suppressing information. It pointed out that this has encouraged harmful rumours from the western press, which were being used as propaganda in the West. Gorbachev also used this situation to eliminate political opposition and to avoid being held accountable by punishing ministers and managers of Chernobyl nuclear power plant, responsible for either contributing to the accident or for insufficient handling of the evacuations and consequences.

Harm done to regime's credibility was especially serious in countries directly involved in the situation: Ukraine, Belorussia and Baltic countries. It augmented prevailing dissatisfaction with approach of Moscow towards these republics

3.1.3. Consequences

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[35] BROOKINGS INSTITUTION. ED. A. HEWETT ... ED. Milestones in glasnost and perestroyka. Washington, DC: Brookings Institution, 1991. ISBN 0815736231.
[36] The Chernobyl's Accident: Social and Political implications. [online]. [cit. 2018-04-14]. Copyright 2012. Available at: https://www.cia.gov/library/readingroom/docs/CIA-RDP08S01350R000300900002-4.pdf
[37] *The Battle of Chernobyl*, [movie] Directed by Thomas Johnson, Francie Discovery Channel, c 2006

The forced life-time relocation of Ukrainian and Belorussian citizens and extreme contamination of large areas highlighted the debate on issues of Soviet policy of placing Nuclear power plants close to inhabited areas and strengthened the environmentalist lobby. These efforts led to improvement in work safety regulations, ecology, public health, medical system and many other areas.

The Chernobyl accident is often regarded as a significant factor in success of Gorbachev's government and his *„glasnost"* policy, which subsequently helped in improving relationship between the West (USA and NATO allies) and Eastern Bloc.

Gorbachev and Reagan met in five summits between 1985 and 1988. Their discussions resulted in the signing of the Intermediate-Range Nuclear Forces Treaty in 1987, which resulted in a major reduction in both nations' weapons stockpiles. Eventual withdrawal of Soviet troops from Afghanistan, led to the End of Cold War [38](The Chernobyl's accident, 2012).

Perestroika restructured the production quotas and other systems in Soviet planned economy and incorporated some market principles. The most significant being the private ownership of businesses, which paved the way for foreign investment and economical growth.

Less restrictions on travel for citizens, allowed increased information interchange, along with transmission of western popular culture, ideas and goods.

The most far-reaching effects this policy had were summarized in Gorbachev's speech at the United Nations in December 1988. He declared that "*all nations should be free to choose their own course without outside interference, announcing that the USSR would significantly reduce the number of troops and tanks that were based in the Eastern Bloc countries."*

Gorbachev's move had unintended consequences, which eventually resulted in dissolution of Soviet Union [39] (Perestroika and Glasnost, 2018).

3.2. Use of Nuclear Energy

3.2.1. Background

Strong awareness of the potential hazard from generating electricity with nuclear power has been present since its beginnings. Nuclear power plants have been designed and operated in a way, which minimizes the likelihood of accidents as well as the human consequences, should any malfunctions occur.

"*The International Atomic Energy Agency (IAEA) was set up by the United Nations in 1957. One of its functions was to act as an auditor of world nuclear safety, and this role was increased following the Chernobyl accident. It prescribes safety procedures and the reporting*

[38] ibid
[39] Perestroika and Glasnost. Www.history.com [online]. USA: A+E Networks, 2010 [cit. 2018-04-14]. Available at: https://www.history.com/topics/cold-war/perestroika-and -glasnost

*of even minor incidents. Its role has been strengthened since 1996. Every country which operates nuclear power plants has a nuclear safety inspectorate and all work closely with the IAEA (*World Nuclear Association, 2018).”

To this day there have been three major reactor accidents in the history of civil nuclear power:

- **Three Mile Island (USA 1979)** – Caused by cooling malfunction. Radiation from the severely damaged reactor was contained and releases were minimal. There were no causalities or adverse health or environmental consequences. Power plant’s operating license has been renewed in 2009, lasting until year 2034.
- **Chernobyl -** (Ukraine 1986) – The only accident, in which workers or members of the public has ever died as a result of exposure to radiation due to a commercial nuclear reactor incident. (see 2.2 for details)
- **Fukushima** - (Japan 2011) - Reactors’ cooling systems have been damaged by tsunami and rendered unusable. Consecutive containment has been inadequate, causing a release of radioactive particles into underwater reservoirs and the ocean. There were no deaths or serious injuries due to radioactivity only caused by the tsunami. Only plant workers received higher than allowed amounts of radiation, but with no effects on health.

As of 2017, there have been more than 100 serious nuclear accidents and incidents caused by the use of nuclear power. Fifty-seven accidents have occurred since the Chernobyl disaster, and about 60% of all nuclear-related accidents have occurred in the USA [40] (World Nuclear Association, 2018).

3.2.2. Chernobyl’s influence

Chernobyl accident was result of number of factors, the main one being flawed design of RBMK reactors, which did not have a containment structure like those used in the West or in post-1980 Soviet designs. This led to number of changes:

3.2.3. Improvements in safety and cooperation

Changes were especially noticeable in the Eastern Europe, largely due to the development of a culture of safety encouraged by increased cooperation between East and West, and substantial investments.

Since 1989, over 1000 nuclear engineers from the former Soviet Union have visited Western nuclear power plants and vice versa. Over 50 arrangements between East and West nuclear plants have been put in place. Most of this has been organized under the World Association of

[40] Safety of Nuclear Reactors - World Nuclear Association.,[online]. Copyright © 2016, 2017, 2018 World Nuclear Association, registered in England and Wales, number 01215741. [cit. 16.04.2018]. Available at: http://www.world-nuclear.org/information-library/safety-and-security/safety-of-plants/safety-of-nuclear-power-reactors.aspx

Nuclear Operators (WANO), a body formed in 1989, linking 130 operators of nuclear power plants in more than 30 countries

Power plant units in Europe, which were using RBMK reactor design or an early Russian PWR design, the VVER-440/V-230, were closed down, renewed or replaced, as a condition of EU admission.

More than 700 safety-related projects were realized in former Eastern Bloc countries following Chernobyl. Number of them was backed by international funding arrangements. The Nuclear Safety Assistance Coordination Centre database lists Western aid totalling almost US$1 billion for The Convention on Nuclear Safety adopted in Vienna in June 1994, with continuous meetings taking place to this day [41] (World Nuclear Association, 2018).

3.2.4. Approach to use of nuclear energy

Concerns regarding the safety of nuclear energy have been an issue since its beginnings and opinions on them varied. Some European countries (Britain, France and West Germany) already committed to nuclear power continued in their set-up nuclear programs.

The existence of Nuclear power plants has been challenged by the wave of opposition, rising in reaction to the Chernobyl accident and newly discovered and documented consequences, as well as other disadvantages, which significantly affected (mainly) European attitudes towards nuclear power, which prevail to this day, Examples being:

Denmark, Greece, Italy, Ireland and Norway have no nuclear power plants and Australia and Austria have restricted new constructions.

Belgium, Germany and Spain, decided not to build new plants or intend to phase out nuclear power, although the portion of electrical energy produced by nuclear power is still significant in those countries.

Anti-nuclear movements, especially in Germany and Austria have a long history. Bolstered by success in 1970s and negative reactions to the Chernobyl accident, they have gained a large following and political representation in the Green Party.

On the other side of spectrum, nuclear power is being recognized as having certain advantages and is regarded as the answer for many ensuing global issues, such as: increase in energy demand due to urbanisation, economical and population growth, reducing pollution, and preventing greenhouse effect, he shortage of fossil fuels and many others. Many countries see this as a viable option. New reactors are being built in many European, Asian and South and North American countries including the United Kingdom and the United States of America [23](World Nuclear Association, 2018).

[41] ibid

United Kingdom –Has eight nuclear power stations which generate around 20% of power in the UK. Almost all of these existing power stations are due to close by 2030. In 2016 the UK government committed to support the new Hinkley Point C nuclear power station, mainly due to current inefficient reduction on CO2 emissions from fossil power plants and difficulties in obtaining adequate gas supplies, for plants having lesser emissions [42] (GOV.UK, 2016).

USA – Through the 2000s a number of factors had led to an increased interest in building new nuclear reactors, including rising demand for power, new lower-cost reactor designs, and concerns about global climate change. After reaching peak production in 2007, US nuclear capacity has been undergoing constant reduction every year.

By 2009, around 30 new reactors were planned, and a number of existing reactors had applied for upgrades to increase their output. By 2012 and 2013 the vast majority of these plans were cancelled. Currently only five new reactors are under construction.

This situation can be contributed to many factors: rapidly falling prices of natural gas, high building costs, lack of investors or anti-nuclear movement. [43](World Nuclear Association, 2018)

3.3. Environment

The accident caused the largest uncontrolled radioactive release into the environment ever recorded for any non-military operation. Radioactive substances were being released into the air for about 10 days. Largest portion of material was deposited close to the reactor, as dust and debris, but the lighter material, such as highly radioactive graphite, was carried by wind over a large distance. More than 200 000 km2 of Europe were contaminated with high levels of caesium-137. Over 70 % of this area lies in the three most affected countries, Belarus, Russia and Ukraine. To some extent the radioactive fallout reached Scandinavia and rest of Europe.

Radioactive material was distributed unevenly, depending on weather conditions. For example, radioactive deposits were larger in areas where it was raining when the contaminated air was present [44](World Nuclear Association, 2018).

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[42] Government confirms Hinkley Point C project – GOV.UK [online] Copyright © Crown copyright [cit. 16.04.2018]. Available at: https://www.gov.uk/government/news/government-confirms-hinkley-point-c-project-following-new-agreement-in-principle-with-edf

[43] Safety of Nuclear Reactors - World Nuclear Association.,[online]. Copyright © 2016, 2017, 2018 World Nuclear Association, registered in England and Wales, number 01215741. [cit. 16.04.2018]. Available at: http://www.world-nuclear.org/information-library/safety-and-security/safety-of-plants/safety-of-nuclear-power-reactors.aspx

[44] Chernobyl | Chernobyl Accident | Chernobyl Disaster - World Nuclear Association. World Nuclear Association - World Nuclear Association [online]. Copyright © 2016, 2017, 2018 World Nuclear Association, registered in England and Wales, number 01215741. [cit. 29.04.2018]. Available at: http://www.world-nuclear.org/information-library/safety-and-security/safety-of-plants/chernobyl-accident.aspx

The main radionuclides released from the reactor were iodine-131, cesium-134 and caesium-137. Iodine-131 has a short radioactive half-life (eight days), but it can be transferred to humans rapidly from the air and through consumption of contaminated crops or produce and animal meat. This was the biggest concern during first 2 months after the accident, resulting in large quantities of produce from affected countries being banned for export and consumption; some of those bans apply to this day. Iodine becomes localized in the thyroid gland. Young children were more susceptible to this exposure.

The isotopes of cesium have longer half-lives (cesium-134, 2 years, cesium-137, 30 years). These cause longer-term exposures through contaminated dust and soil and internally through the ingestion of crops, growing on the contaminated soil or animal produce. (see 3.4.2.)

The most contaminated areas are forests and mountains. Cesium is continuously absorbed and passed on by all organisms in the forest ecosystems, some of which grow even outside the Zone, but are still highly radioactive upon consumption, such as mushrooms or berries.

During the first few years after the accident, the levels of radioactive materials in agricultural plants and animals decreased quickly because of weathering and decay. The radioactive levels have gone down slowly, but significantly during the last 10 years and today, the levels of cesium-137 in food products are generally below national and international levels [45](GreenFacts Scientific Board, 2018).

3.3.1. Water bodies

In general, approximately 80% of the total radiation dose accumulated by plants and animals was received within 3 months of the accident. Radioactive particles deposited in rivers, lakes and water reservoirs close to the reactor site have reached water bodies in other parts of Europe.

The amount decreased rapidly during first 3 weeks, thanks to decay a dilution or absorption by soils. The only radionuclide present in higher amounts in fish, during the last decade was strontium-90, which leaves to no significant human exposure, as it accumulates mainly in bones, rather than in edible parts. At present, the water and fish of rivers, open lakes and reservoirs still have a low level of caesium-137 and strontium-90 contamination; however in closed water bodies these numbers tend to be higher.

3.3.2. Terrestrial animals

The accident had many immediate harmful effects on plants and animals living within 30 km Zone at the time of the accident. However, there are no reports of any such radiation-induced

[45] Chernobyl: 3. How has the environment been affected by the Chernobyl accident?. [online]. Copyright 2018 © GreenFacts Scientific Board [cit. 18.04.2018]. Available at: https://www.greenfacts.org/en/chernobyl/l-2/3-chernobyl-environment.html

effects in plants and animals outside this area. Each plant and animal responded differently to the effects depending on its sensitivity and dose received.

At relatively close distances from the reactor, there was an increase in mortality and a decrease in reproduction ability. During the first few years, plants and animals showed many genetic changes and defects, this prevails to this day.

Populations have been successfully recovering from reduction in numbers and the long term-exposure effects, by means of migration from other areas. Thanks to sharp decrease in human activities in the area, the Zone is becoming a unique and very diverse wildlife sanctuary [46](GreenFacts Scientific Board, 2018).

3.4. Population

3.4.1. Resettlement

By 14 May (3 weeks after explosion), approximately 116,000 people who had been living within a 30-kilometre radius of the Chernobyl Power plant had been evacuated and stationed in large cities in the proximity and later relocated to a new built city of Slavutych. (see 2.1.4.) Another 230 000 people were relocated in subsequent years.

Currently about five million people live in areas of Belarus, the Russian Federation and Ukraine in areas with high levels of radioactive caesium. About 270 000 people continue to live in areas classified by Soviet authorities as strictly controlled zones [47](World Health Organization, 2006).

Evacuation and relocation proved to be a traumatic experience to many, leaving marks on people's mental health, as a result of disruption of social networks, without possibility to ever return to their homes. For many there was a social stigma associated with being an "exposed person" and with being treated badly by other inhabitants. This was due to lack of information, overall distrust in official media and the false attribution of most health problems to radiation exposure from Chernobyl. (See 3.5.)

About 1000 of these evacuees returned unofficially to live within the contaminated zone, some in a matter of months after the accident. These people were later called «самосёлы» transcribed as "самосёлы", meaning: self-settlers. Majority of them were women, from villages, who lived through WW2 and/or Stalin's famine in Ukraine and are oblivious to dangers radiation. As cited by one of women Hanna Zavorotnya: *"Radiation doesn't scare me. Starvation does."*

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[46] Chernobyl: 3. How has the environment been affected by the Chernobyl accident?. [online]. Copyright 2018 © GreenFacts Scientific Board [cit. 18.04.2018]. Available at: https://www.greenfacts.org/en/chernobyl/l-2/3-chernobyl-environment.html

[47] WHO | Health effects of the Chernobyl accident: an overview. WHO Copyright 2018[online[cit. 26.03.2018]. Available at: http://www.who.int/ionizing_radiation/chernobyl/backgrounder/en/

They are among the official victims of Chernobyl accident, and receive their retirement money. They are regularly sent for medical screenings into Chernobyl town and visited by researchers, who test the radiation levels in their crops, produce and soil. These screenings provide valuable data on long-term effects of exposure to high levels of radiation.

Today, there are approximately 130 such women, in their 70s and 80s, living in villages, which were not razed during the restoration process. The number of inhabitants per village ranges from a person to 12 people. Majority of those self-settlers have to produce their own food, or rely on gathering, since public transport or services are non-existent in the Zone and some villages are rather remote from the Chernobyl town [48](The Babushkas of Chernobyl, 2015).

3.4.2. Health

Health effects of Chernobyl accident have been studied by health professionals extensively for decades as well as misinterpreted and exaggerated by media due to lack of reliable information immediately after the accident and before the fall of USSR.

The World Health Organization (WHO) conducted a series of expert meetings within the initiative of UN Chernobyl Forum from 2003 to 2005. Aiming to review all scientific evidence on health effects associated with the accident, gathered over 20 years of research.

The Expert Group had conducted studies in the three affected countries and was provided with expertises by scientists in other parts of the World. Special health care programmes, were promoted to treat the most affected inhabitants of Ukraine, Belarus and Russia.

The total average effective doses accumulated over 20 years in the exposed populations, are relatively low, compared with doses received in normal settings. The highest doses of radiation were received by people present at the time of accident, then by inhabitants of the future Zone and by liquidators

134 emergency workers who received high doses of radiation were diagnosed with acute radiation syndrome. Causalities related directly to the accident were 2 employees killed by explosion, and 28 firefighters. These died within several weeks after receiving lethal doses of radiation. Such acute radiation poisoning causes degrading changes in cells due to damage to DNA and other key molecular structures in various tissues. This destruction, particularly affects the ability of cells to divide normally, in turn causes number of symptoms. The symptoms can begin within few hours and may last for several months. Depending on the exposure, the common symptoms are gastrointestinal effects, such as nausea and vomiting and predisposition to infection and bleeding, due to reduction in blood cell production. After the initial onset commonly a latency period ensues. Larger doses can result in neurological

[48] *The Babushkas of Chernobyl* [film], Directed by Anne Bogart, Holly Morris, USA, 2015

effects, including seizures, tremors, lethargy, and rapid death. The rest of these people showed an array of syndromes and health problem, caused by radiation. This radiation sickness requires life-time treatment and shortened heir life-span significantly.[49](World Health Organization, 2006)

The only traceable direct health effect of the radiation on the population is the increase in the incidence of thyroid cancer in people who were young children and adolescents at the time of the accident and lived in the most contaminated areas. This type of cancer was caused by radioactive iodine ingested with contaminated milk in the first days of the disaster.

As of 2012, in Belarus, Russia and Ukraine nearly, 6 000 cases of thyroid cancer have been diagnosed among children who were 18 years or younger at the time of the accident. While a large number of these cancers resulted from radiation following the accident, intense medical monitoring has also resulted in the detection of thyroid cancers not related to Chernobyl accident, and contributed to the increase in numbers. Treatment has been highly effective even in serious cases and the general prognosis for young patients is good. It is expected that the increased incidence of thyroid cancer from Chernobyl will continue for years [50] (Fukushima and Chernobyl: Myth vs. Reality, 2012).

Other possible effects related directly to disaster are yet to be proven, among those are:

Leukaemia and non-thyroid solid cancer

Ionizing radiation is a known cause of certain types of leukaemia (a malignancy of blood cells), as was discovered among the survivors of the atomic bombings in Japan. 2006 investigations suggest an increased incidence of leukaemia among the most highly exposed Chernobyl liquidators. No such increase has been clearly demonstrated among children or adults residents. It is possible that a large proportion of the leukaemia cases which could be linked to Chernobyl have already occurred, further studies are needed to clarify this.

Reviews by the WHO Expert Group revealed no evidence of increased cancer risks other than thyroid cancer. Reports indicate a small increase in the incidence of pre-menopausal breast cancer in the most contaminated areas, which appear to be related to radiation dose. Both of these findings, however, need confirmation Based on the experience of atomic bomb survivors, a small increase in the risk of cancer is expected, even at the low to moderate doses

[49] WHO | Health effects of the Chernobyl accident: an overview. [online]. WHO Copyright 2018[cit. 26.03.2018]. Available at: http://www.who.int/ionizing_radiation/chernobyl/backgrounder/en/

[50] Fukushima and Chernobyl: Myth versus Reality - World Nuclear Association. World Nuclear Association - World Nuclear Association [online]. Copyright © 2016, 2017, 2018 World Nuclear Association, registered in England and Wales, number 01215741. [cit. 19.04.2018]. Available at: http://www.world-nuclear.org/focus/fukushima/fukushima-and-chernobyl-myth-versus-reality.aspx

received. Such an increase is expected to be difficult to identify [51](World Health Organisation, 2006).

3.4.3. Mortality

An increased number of cancer deaths can be expected during the lifetime of people exposed to radiation from the accident. The number of such deaths can be only estimated, since it is difficult to determine, which particular cases were caused by radiation. Chernobyl caused mainly low doses over a long time, while bombings caused high doses in short time-span. This and other factors, such as differences in lifestyle, contribute to uncertainties in future projections.

In addition, over the past 15 years a significant non-radiation related reduction in the average lifespan in the three countries was contributed to alcoholism, smoking and reduced health care, have significantly increased the difficulties in detecting any effect of radiation on cancer mortality.

The Expert Group (2006) concluded that there may be up to 4 000 additional cancer deaths among the three highest exposed groups over their lifetime (240 000 liquidators; 116 000 evacuees and the 270 000 residents of the controlled zones). Cancer deaths from radiation exposure correspond to 3-4% above the normal incidence of cancers from all causes. [52](World Health Organisation, 2006)

3.4.4. Cardiovascular disease

A large-scale Russian study among emergency workers has suggested an increased risk of death from cardiovascular disease in individual exposed to high doses. It is consistent with other studies, for example, on radiotherapy patients, who received considerably higher doses to the heart.

3.4.5. Mental health and psychological effects

Were in majority cause by resettlement (see 3.4.1) and are threats to health for current and possibly future generations. The dissolution of the Soviet Union, insufficiency of health care and overall panic and fear of radiation in the first years after the added further to these reactions. High levels of stress, anxiety and medically unexplained physical symptoms continue to be reported among those affected by the accident.

Population has been affected mainly at a sub-clinical level that has not generally resulted in medically diagnosed disorders. Being designed as “victims” has led to feelings of helplessness increase in risky behaviours such as drugs/alcohol overuse and hypochondria.

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[51] WHO | Health effects of the Chernobyl accident: an overview. [online]. WHO Copyright 2018[cit. 26.03.2018]. Available at: http://www.who.int/ionizing_radiation/chernobyl/backgrounder/en/

[52]ibid

3.4.6. Reproductive and hereditary effects and children's health

Given the low radiation doses received by most people exposed to the Chernobyl accident, no effects on fertility, numbers of stillbirths, adverse pregnancy outcomes or delivery complications have been demonstrated. A modest but steady increase in reported congenital malformations in both contaminated and uncontaminated areas of Belarus appears related to improved research and reporting and not to radiation exposure. This is often disputed by other researchers or organizations, since the results of experiments on animals and screenings of animals living in Chernobyl Zone showed higher rates of birth defects and lower fertility. No research has proved these claims in human population.

According to WHO, there is no convincing evidence of any direct effects on fertility among the general population of Chernobyl-affected regions. The doses received by population were too low to cause birth defects or affect the number of stillbirths, miscarriages, delivery complications. Lower birth rates may be attributed to concerns about having children, the high number of medical abortions, proposed by doctors as a safety measure and migration of younger populations [53](World Health Organisation, 2006).

3.4.7. Chernobyl today

Since its establishment as a tourist site in 2011, the interest of tourists, from all over the world has been steadily increasing. As of 2015 The Zone is visited approximately by 10 000 tourist each year.[54](Daily Mail Online, 2015). This can be attributed to the references in current popular culture and media as well as to overall increase of interest in "Disaster tourism" and "Dark tourism". A tourism involving travel to places associated with death, tragedy and catastrophes [55](The darker side of travel, 2010).

Only visitors with valid passport and visit permit are allowed to visit the Zone for a guided tour. Authorities had issued a set of rules, which must be obliged. These include: clothing rules, a ban on food or beverage consumption out in the open, on touching, collecting and smuggling any objects from the Zone, acquiring photos in the power plant area and strict ban on entering the buildings in Pripyat city, to avoid any danger.

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[53] ibid

[54] How Chernobyl now has TEN THOUSAND tourists a year | Daily Mail Online. [online]. Copyright © 2015 Associated Newspapers Ltd [cit. 20.04.2018]. Available at: http://www.dailymail.co.uk/travel/travel_news/article-3047031/Chernobyl-thriving-holiday-destination-following-rise-dark-tourism-phenomenon.html

[55] James Pardoe. The darker side of travel: the theory and practice of dark tourism. Journal of Heritage Tourism [online]. 2010, 2010, (5), 173-174 [cit.2018-04-20]. Available at: https://www.tandfonline.com/doi/full/10.1080/17438731003678915?src=recsys

A long-term goal of Zone's authorities, as well as of touring companies, is the establishment of The Chernobyl National Park, to preserve its cultural and natural values and eventually, turning the Zone into UNESCO World Heritage Site [56](CHERNOBYL-TOUR, 2018).

[56] CHORNOBYL TOUR® - [online]. Copyright © 2008 [cit.20.04.2018]. Available at: https://chernobyl-tour.com/english/

4. Chernobyl in Popular Culture

4.1. Definition and Background

The Popular culture or the pop culture is generally defined as a set of practices, beliefs, and objects that are dominant, largely recognized or preferred by society during a certain period in time. At the same it is also regarded as an "empty" concept, which can be further defined differently by different people in various contextual settings. It is significantly influenced by mass media. These concepts have effects on everyday life of the society and possess the ability to influence opinions and attitudes of individuals towards certain topics. Various surveys proved that the younger population is more likely to be influenced by popular culture and thus can be considered its biggest consumer. The popular culture is one of the means of globalization.

The term popular culture was generally associated with lower classes and set into opposition with the "official" or "high" culture of the time, a culture more prevalent among higher classes. Following the major cultural and social changes, brought by the innovations in media, after the World War II, the meaning of popular culture began to overlap with those of mass culture [57](Cultural theory and popular culture, 2012).

4.1.1. Popular culture in the USA

Since the begging of 20th century changes taking place in the United States were a pioneer in its evolution. In the 1950s, bolstered by successful economy, affluence of people, many innovations in media, communication and psychology, they eventually established themselves as the biggest producer of popular culture goods.

This led to prevalence of U.S. influences in the globalization process. Due to these facts it also referred to as "Americanization". US Popular culture generally represents the American lifestyle, American dream and values; this influences the perception of US by other nations. The speed of cultural interchange has been growing significantly in recent years, due to pervasiveness of the Internet and social networks.

The entertainment industry is one of the most important industrial branches in the U.S. It generates more revenue from overseas sales than any other industry with the exception of commercial aerospace industry. American movies and television shows are therefore an important commodity among U.S. exports. With regard to such cultural products, foreign nations are forced to protect their domestic entertainment industries in order to maintain

[57] STOREY, John. Cultural theory and popular culture: an introduction. 6th ed. Harlow: Pearson, 2012. ISBN 978-1-4082-8527-5.

domestic entertainment industry and to regulate and observe the effects on their own culture and popular culture [58](Globalization 101, 2017).

Americanization is also seen as beneficial in some regards, for example: it provides a social common ground for different groups of people, it allows the exposure to different views and topics and bolsters the economy by encouraging new purchases and faster changes in tastes [59] (The Effects That American Pop Culture Has on Our Everyday Lives, 2014).

4.1.2. Popular Culture in UK

British popular culture has been historically closely related to American popular culture, sharing the same language and origin resulted in extensive interchange of pop culture aspects in both directions, since the times colonization. After World War II, Britain, having less economic power and smaller entertainment industry in comparison with U.S., produced less popular culture goods; nonetheless their worldwide influence and renown outweigh the quantity and in some aspects its influence precedes the U.S., especially regarding influence in mainland Europe. (Such as fashion and music) [60] (British culture rules the world, says author, 2015).

5. Works of popular culture related to Chernobyl

The Chernobyl disaster and its consequences had significant influence on culture and politics of many countries. The nature of radiation and disaster itself, the lack of proper information and diversion of opinions on true range of its consequences, had caused an emergence of myths, misconceptions and irrational fear of radiation, which are recurring topics in popular culture to this day [61](Religion and 'Radiation Culture, 2016).

5.1. Literature

5.1.1. Non-fictional

Listed beneath are non-fictional works of British or American authors or works of other authors published originally in the US.

Chernobyl and Three Mile Island: The History and Legacy of The World's Most Notorious Nuclear Accidents (USA, 1987)

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[58] Pop Culture | Globalization101.org [online]. Copyright © 2017 The Levin Institute [cit. 21.04.2018]. Available at: http://www.globalization101.org/pop-culture/

[59] The Effects That American Pop Culture Has on Our Everyday Lives [online], USA: Demand Media, 2014,[cit. 2018-04-21]. Available at: https://www.csub.edu/~bruff/Pop%20Culture%20Articles.pdf

[60]British culture rules the world, says author [online], theday.co.uk, 2015 .[cit. 2018-04-21] Available at: http://theday.co.uk/chosen-by-you/british-culture-rules-the-world-says-author

[61] Religion and 'Radiation Culture': Spirituality in a Post-Chernobyl World", [online] Elena Romashko Web blog post. Material Religions. 1 June 2016. [cit 21.04.2018] , Available at: http://materialreligions.blogspot.cz/2016/05/religion-and-radiation-culture.html

Authors focus on comparing two nuclear accidents: The Three Mile Island accident (1979) and Chernobyl accident (1986), Facts are narrated with the help of photographs, accounts of the accidents by survivors, workers, and residents. The book includes bibliographies for further reading [62](Amazon.com, 2018).

Truth about Chernobyl (USA, 1991)

Grigorij Medvedev, a former chief engineer of the Cherobyl power plant, and the first investigator of the accident describes the events and causes of Chernobyl disaster, through interviews with major participants in the operation, with an insider's understanding. The work deals mainly with technical and political aspects [63](Amazon.com, 1996).

Voices from Chernobyl – The Oral History of a Nuclear Disaster (1997Russia/2006 USA)

The first book to present personal accounts of the tragedy, gathered during 3 years of research. Journalist Svetlana Alexievich interviewed hundreds of people affected by the disaster including innocent citizens, firefighters and their relatives, liquidators, re-settlers and many others. It is composed of interviews in monologue form. The book was critically acclaimed, awarding Alexievich the Nobel Prize for Literature in 2015, the academy cited her for inventing "a new kind of literary genre" 64(DailyMaverick, 2016).

Chernobyl: Catastrophe and Consequences (USA 2005)

"The authors provide a detailed review of the long-term environmental consequences, in a wide range of ecosystems, many of which are only now becoming apparent. They also highlight responses and counter-measures to combat the environmental consequences" [65](Amazon.com, 2005)."

Visit Sunny Chernobyl: And Other Adventures in the World's Most Polluted Places (USA, 2013)

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[62]Chernobyl and Three Mile Island: The History and Legacy of The World's Most Notorious Nuclear Accidents [online], Amazon.com, 2014, [cit. 22.04.2018]. Available at: https://www.amazon.com/Chernobyl-Three-Mile-Island-Notorious/dp/1502883929/ref=tmm_pap_swatch_0?_encoding=UTF8&qid=&sr=#customerReviews

[63] Truth About Chernobyl, Amazon.com [online]. Copyright © 1996 [cit.29.04.2018]. Available at: https://www.amazon.com/Truth-About-Chernobyl-Grigori-Medvedev/dp/0465087752/ref=sr_1_6?s=books&ie=UTF8&qid=1524405738&sr=1-6&keywords=Chernobyl

[64] Book review: The official incompetence, laziness and cronyism – behind the nightmare of Chernobyl, [online]. Copyright Daily Maverick 2016 Available at: https://www.dailymaverick.co.za/article/2016-02-14-book-review-the-official-incompetence-laziness-and-cronyism-behind-the-nightmare-of-chernobyl/#.Wtz4bC5ua00

[65] Chernobyl: Catastrophe and Consequences, Amazon.com: [online]. Copyright © 2005 [cit. 22.04.2018]. Available at: https://www.amazon.com/Chernobyl-Catastrophe-Consequences-Springer-Praxis/dp/3540238662/ref=sr_1_18?s=books&ie=UTF8&qid=1524405829&sr=1

"Andrew Blackwell embraces a different kind of travel, taking a jaunt through the most gruesomely polluted places on Earth. [66]*(*Goodreads.com, 2013)."

Chernobyl's Wild Kingdom: Life in the Dead Zone (USA, 2015)

The author specializes in writing educational literature for children. This book aims to provide a look into Chernobyl's rich fauna [67](Amazon.com, 2015).

Atomic Accidents: A History of Nuclear Meltdowns and Disasters: From the Ozark Mountains to Fukushima (USA, 2015)

This book by nuclear engineer Mahaffey provides an insight into each incident and analyses the causes and consequences, often revealing mistakes of his predecessors' conclusions [68] (Amazon.com, 2015).

Chernobyl 01:23:40: The Incredible True Story of the World's Worst Nuclear Disaster (UK, 2016)

The book summarizes the results of author's five year research and presents an accessible and comprehensive account of events. The narration of historical and technical facts is interwoven with a story of the author's journey to city of Pripyat and the Chernobyl Zone. Containing over 45 pages of photographs of Pripyat and technical diagrams of the power station, it is ranked as #1 bestseller in travel guides in Ukraine and Belorussia [69](Amazon.com, 2016).

Chernobyl: The History of a Nuclear Catastrophe (USA, 2018)

Serhii Plokhy (aka Mykhailo Hrushevsky) is The Professor of Ukrainian History and director of the Ukrainian Research Institute at Harvard University. *"He provides the definitive story of the Chernobyl crisis and its aftermath, skillfully covering all angles from the scientific story, the humanitarian and economic costs of the clean-up, the manner in which the explosion*

[66] Visit Sunny Chernobyl: And Other Adventures in the World's Most Polluted Places [online]. Copyright 2013 © [cit. 22.04.2018]. Available at: https://www.goodreads.com/book/show/13165313-visit-sunny-chernobyl
[67]Chernobyl's Wild Kingdom: Life in the Dead Zone Copyright © 2014 [cit. 29.04.2018]. Available at: https://www.amazon.com/Chernobyls-Wild-Kingdom-Life-Dead/dp/1467711543
[68] Atomic Accidents: A History of Nuclear Meltdowns and Disasters: From the Ozark Mountains to Fukushima, Amazon.com, Copyright © 2015 [cit. 22.04.2018]. Available at: https://www.amazon.com/Atomic-Accidents-Meltdowns-Disasters-Mountains/dp/1605986801/ref=sr_1_21?s=books&ie=UTF8&qid=1524405829&sr=1-21&keywords=Chernobyl
[69]Chernobyl 01:23:40: The Incredible True Story of the World's Worst Nuclear Disaster [online], Amazon.com, 2016 [cit. 22.04.2018]. Available at: https://www.amazon.com/Chernobyl-01-Incredible-Nuclear-Disaster/dp/0993597505/ref=sr_1_1?s=books&ie=UTF8&qid=1524405738&sr=1-1&keywords=Chernobyl

forced Gorbachev to jump-start his perestroika reforms, and the igniting of Ukrainian nationalism." Andrew Wilson, Professor of Ukrainian Studies, UCL [70](Amazon.com,2018).“

5.1.2. Notable works by authors outside of UK and USA

Chernobyl: The Forbidden Truth (1995)

A former journalist from a city, near the Chernobyl power plant, Zhitomir describes the 1986 Chernobyl disaster and the bureaucratic and scientific corruption surrounding it. It provides accounts of victims and facts from journalistic, as well as insider’s point of view [71] (Amazon.com, 1996).

Life Exposed: Biological Citizens after Chernobyl (2002)

The book provides an anthropological insight into the Chernobyl disaster and offers a framework for understanding the politics before and after the fall of the USSR [72](Amazon.com, 2002).

Chernobyl: Confessions of a Reporter (2007)

The author, being the first person to document damaged reactor No. 4, provides firsthand accounts of the event and number of unique photographs from the operation [73](Amazon.com, 2007).

5.1.3. Fictional

A list of fictional books, related to Chernobyl, which gained renown in the US or the UK or were written by British or American authors.

All That Is Solid Melts into Air (USA, 1983)

This novel uses Chernobyl disaster as a background for a love story, realistically depicting the end of the Soviet era and major life changes.[74](Goodreads.com, 2014)

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[70] Chernobyl: The History of a Nuclear Catastrophe: Serhii Plokhy: Amazon.com: Books. [online]. Copyright © 2018 [cit. 22.04.2018]. Available at: https://www.amazon.com/Chernobyl-History-Catastrophe-Serhii-Plokhy/dp/1541617096/ref=sr_1_2?s=books&ie=UTF8&qid=1524422525&sr=1-2&keywords=Chernobyl

[71] Chernobyl: The Forbidden Truth [online]. Amazon.com , Copyright © 1995 [cit. 22.04.2018]. Available at: https://www.amazon.com/Chernobyl-Forbidden-Truth-Alla-Yaroshinskaya/dp/0803299109/ref=sr_1_8?s=books&ie=UTF8&qid=1524422525&sr=1-8&keywords=Chernobyl

[72] Life Exposed: Biological Citizens after Chernobyl [online]. Copyright © 2002 [cit. 22.04.2018].Available at: https://www.amazon.com/Life-Exposed-Biological-Chernobyl-2002-12-01/dp/B01FEKNHK0/ref=sr_1_2?s=books&ie=UTF8&qid=1524424818&sr=1-2&keywords=Life+Exposed%3A+Biological+Citizens+after+Chernobyl

[73] Chernobyl: Confessions of the reporter, Amazon.com [online]. Copyright © 2007 [cit. 29.04.2018]. Available at: https://www.amazon.com/Chernobyl-Confessions-Reporter-Kostin-Igor/dp/B00DJF911W/ref=sr_1_2?s=books&ie=UTF8&qid=1524955388&sr=1-2&keywords=Chernobyl%3A+Confessions+of+a+Reporter+by+Igor+Kostin

Being reviewed by critics and used for reference in memorial articles about Chernobyl. These works are recognized as pivotal in use of Chernobyl in fictional setting while staying out of realms of science-fiction and fantasy. Sci-fi/fantasy inspired literature related to Chernobyl accident has become a specific genre, which gained popularity among younger authors and audiences, especially in the last decade. [75](The Atlantic.com, 2016) Large amount of the works are self-published or published through retailer sites such as Amazon.com or Bookreads.com.

Chernobyl: A Novel (USA, 1987)

Written by Frederik Pohl (1919-2013) one of the science fiction's most important and renowned US authors, it is a thriller/docudrama set in the city of Pripyat and Chernobyl power plant. The story is told through fictional characters--primarily officials and workers at the plant--but closely traces events and the way they were documented in the Soviet press and Moscow's report to the International Atomic Energy Association. It allows readers to immerse into lifestyle and mindset of common citizens living in plant's proximity and focuses on human aspects of the disaster [76] (Goodreads.com, 2018).

Wolves Eat Dogs (USA, 2004)

It is the fifth novel in the series of novels featuring Investigator Arkady Renko, taking place in post-soviet Ukraine. Renko is sent to investigate a suspicious, high-profile suicide. Later he is called off a suspicious suicide case, and sent to the "Zone of Exclusion" (the site of the Chernobyl nuclear accident) to investigate a related case, a murder first victim's business partner.

The book comments on a state of post-soviet society, political issues, widespread corruption, effects of radiation and peculiarities of the Zone, its personnel and inhabitants 77(The Guardian, 2005).

The Zero Meter Diving Team (USA, 2007)

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[74]All That Is Solid Melts into Air: A Novel [online]. Copyright 2014 © [cit.23.04.2018]. Available at: https://www.goodreads.com/book/show/18505785-all-that-is-solid-melts-into-air

[75] In the 30 Years After Chernobyl, the Writers Svetlana Alexievich, Christa Wolf, and Darragh McKeon Tried to Make Sense of the Disaster [online]. Copyright The Atlantic.com , 2016, Available at: https://www.theatlantic.com/entertainment/archive/2016/04/chernobyls-literary-legacy/479769/

[76] Chernobyl: A Novel, Frederik Pohl [online]. Copyright Goodreads.com © [cit. 22.04.2018]. Available at: https://www.goodreads.com/book/show/597180.Chernobyl

[77] Review: Wolves Eat Dogs by Martin Cruz Smith. [online]. Copyright © 2018 Guardian News and Media Limited. [cit. 23.04.2018]. Available at: https://www.theguardian.com/books/2005/apr/02/featuresreviews.guardianreview24

A short story in Shephard's collection Like You'd Understand, Anyway. It is a first person account of the accident by the fictional Boris Yakovlevich Prushinsky, chief engineer of the Department of Nuclear Energy at the Chernobyl power station 78(Goodreads.com, 2007).

Accident: A Day's News (UK, 2001)

A lyrical stream of thought of an East German writer, contemplating life and mortality after hearing news of Chernobyl accident, while awaiting a call from the hospital where her brother is undergoing brain surgery. Novel seems to have been written under the belief that the explosion resulted from a random accident, caused by the nuclear power itself [79](The Atlantic.com, 2016).

Saved by the Bang (UK, 2015)

A dark satirical novel set into Belorussia in 1980s, taking place before and even after disaster. It depicts humorous and romantic adventures of successful music star, which is forced to leave with her daughter after losing her husband to the disaster [80](Amazon.com, 2015).

5.1.4. Sci-fi/fantasy Literature

Exclusion Zone (UK, 2014)

The author of the criminal thriller with unnatural occurrences is the Winner of the BritCrime Pitch Competition 2015 and rising novelist. The story unfolds right after the explosion of reactor No. 4 in close proximity to Pripyat, when a teenager disappeared without a trace. Her younger sister unwittingly uncovers clues to her disappearance, and the secret life that she led, with the help of main protagonist, the investigator PI Alex Harvey [81](Tripfiction.com, 2018).

City of Roses (UK, 2015)

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[78] The Zero Meter Diving Team, Goodreads.com, [online]. Copyright 2007 © [cit.29.04.2018]. Available at: https://www.goodreads.com/book/show/31699120-the-zero-meter-diving-team

[79] In the 30 Years After Chernobyl, the Writers Svetlana Alexievich, Christa Wolf, and Darragh McKeon Tried to Make Sense of the Disaster [online]. Copyright The Atlantic.com , 2016, Available at: https://www.theatlantic.com/entertainment/archive/2016/04/chernobyls-literary-legacy/479769/

[80] Saved by the Bang, Amazon.com ,Copyright 2015 [cit. 23.04.2018]Available at: https://www.amazon.com/Saved-Bang-Marina-J-Neary/dp/1942756542/ref=sr_1_12?s=books&ie=UTF8&qid=1524429974&sr

[81] Thriller set in Pripyat and Chernobyl – plus the author, J M Hewitt, talks location [online]. Copyright © TripFiction 2018 [cit. 23.04.2018]. Available at: https://www.tripfiction.com/thriller-set-in-chernobyl/

The Book offers unique approach to retelling of the 1986 Chernobyl. The author reflects on the disaster and its effects, adding romantic and fantastical elements into the story of battle against the evil creatures [82](Amazon.com, 2015).

Prip'Yat: The Beast of Chernobyl (2012)

This book is horror/adventure tale, taking place in Pripyat and its surroundings. Two army officers are deployed to investigate mysterious disturbances [83] (Amazon.com, 2012.)

METRO series

A trilogy of post-apocalyptic science fiction novels, written by Russian author Dmitry Glukhovsky are one of the bestselling books of this genre worldwide. Translated into many different languages, it gained wide spread popularity. It is set in the Moscow Metro, where the last survivors hide after a global nuclear conflict, which rendered the Earth uninhabitable and caused severe mutations to people and fauna on the surface, along with appearance of otherworldly creatures known as "Dark Ones". The human inhabitants are divided into sovereign states, differing in goals and ideologies, fighting for living space and resources. [84](Metro 2033, 2015) The books in the series in sequential order are: Metro 2033, Metro 2034 and Metro 2035, all of which had been made into separate video games.

5.1.5. Self-published and unofficial literature

Sarcophagus by Philip Hemplow – the story unravels in near fictional future. Original sarcophagus diminishes; the confinement operation is halted due to inexpiable events caused by unknown forces and Protagonist is sent to investigate [85](Amazon.com, 2012).

Child of Chernobyl by Astrid Julian – „*A group of scientists who grew up in the shadow of Chernobyl and were left sterile by the treatments for childhood cancers receive a mysterious message from space that reawakens long-abandoned hopes for parenthood*"[86](Amazon.com, 2012)."

[82] City of Roses, [online]. Amazon.com Copyright © 2015 Available at: https://www.amazon.com/City-Roses-Donovan-Pruitt/dp/1943352003/ref=sr_1_15?s=books&ie=UTF8&qid=1524433177&sr=1-15&keywords=chernobyl+fiction

[83] Prip'Yat: The Beast of Chernobyl [online]. Copyright © 2012 [cit. 29.04.2018]. Available at: https://www.amazon.com/PripYat-Beast-Chernobyl-Mike-Kraus-ebook/dp/B00AA6CM82

[84] GLUCHOVSKIJ, Dmitrij Aleksejevič. Metro 2033. Second Issue. Translation Rudolf ŘEŽÁBEK. Praha: Knižní klub, 2015. ISBN 978-80-242-5116-5.

[85] Sarcophagus eBook: Philip Hemplow:[online]. Amazon.com: Copyright © 2012 [cit. 23.04.2018]. Available at: https://www.amazon.com/Sarcophagus-Philip-Hemplow ebook/dp/B008A7RGUM/ref=sr_1_11?s=books&ie=UTF8&qid=1524429974&sr=111&keywords=chernobyl+fiction

[86] Child of Chernobyl [online]. Copyright © 1996 [cit. 23.04.2018]. Available at: https://www.amazon.com/Child-Chernobyl-Astrid-Julian-ebook/dp/B00CQP4SKU/ref=sr_1_8?s=books&ie=UTF8&qid=1524429974&sr=1-8&keywords=chernobyl+fiction

Chernobyl's New Eden: Ghost of Wolves by Ashley S. Ulrich – Follows 2 packs of wolves living in the radioactive Zone[87] (Amazon.com, 2013).

5.2. Movies and TV series

Listed beneath are works produced and directed by British or American crews or works popular in the US or the UK.

5.2.1. Documentaries

Chernobyl Heart (USA, 2003)

This Academy Award-winning documentary focuses on children born after the 1986 Chernobyl nuclear plant disaster, suffering from health conditions caused by radiation [88](IMDb.com, 2003).

Battle of Chernobyl (France/USA 2006)

First documentary presenting unique photographs and footage of Igor Kostin and featuring testimonials of people in command of the operations, President Mikhail Gorbachev, Hans Blix and number of former liquidators and personnel [89] (IMDb.com, 2006).

Echoes from Chernobyl (USA, 2011)

This documentary showcases the exploration of the Zone and Pripyat and new un-archived footage of the accident. It contains unique interviews with re-settlers, operators, liquidators and safety inspectors[90] (IMDb.com, 2011).

Inside Chernobyl directed (UK 2012)

A short documentary, focused on conditions at the time of the Chernobyl power plant and information cover-up by Soviet government [91](IMDb.com, 2012).

Babushkas of Chernobyl (USA 2015)

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[87] Chernobyl's New Eden: Ghost of Wolves: Amazon.com:[online]. Copyright © 2013 [cit. 23.04.2018]. Available at: https://www.amazon.com/Chernobyls-New-Eden-Ghost-Wolves/dp/1491226811/ref=sr_1_16?s=books&ie=UTF8&qid=1524433177&sr=1-16&keywords=chernobyl+fiction

[88] Chernobyl Heart IMDb.com [online]. Copyright 2003 © [cit. 23.04.2018]. Available at: https://www.imdb.com/title/tt0396959/?ref_=fn_al_tt_1

[89] The Battle of Chernobyl – IMDb.com. [online]. Copyright 2006 © [cit. 23.04.2018]. Available at: https://www.imdb.com/title/tt1832484/?ref_=fn_tt_tt_18

[90] Echoes from Chernobyl (TV Movie) - IMDb. com [online]. Copyright 2011 © [cit. 23.04.2018]. Available at: https://www.imdb.com/title/tt2062518/?ref_=fn_tt_tt_31

[91] Inside Chernobyl , IMDb.com-[online]. Copyright © [cit. 23.04.2018]. Available at: https://www.imdb.com/title/tt4469450/?ref_=fn_tt_tt_27

A documentary portraying the life of group of women who, after the 1986 Chernobyl disaster and evacuation, returned to the exclusion zone surrounding the nuclear power plant and have resided there - semi-officially, for many years [92](IMDb.com, 2015).

Chernobyl 30 Years On: Nuclear Heritage (Germany/UK, 2015)

This documentary focuses on the future of the Zone and steps taken to confine the danger and remedy the consequences [93](IMDb.com, 2015).

The Russian Woodpecker, directed by Chad Garcia (Ukraine/UK/USA 2015)

The award-winning documentary is told through the eyes of artist Fedor Alexandrovich, who believes that the Chernobyl disaster wasn't simply an accident. It investigates the political background, the range of secrecy and provides interviews with many high-officials of Soviet era [94](IMDb.com, 2015).

Life After: Chernobyl (USA 2016)

This documentary explores the impact on animal life in the Zone's area, 30 years after the disaster [95] (IMDb.com, 2016).

5.2.2. Documentaries by foreign authors

Chernobyl: Chronicle of Difficult Weeks, directed by Vladimir Schevchenko, (USSR 1988/ USA 1990)

The first documentary made following the nuclear accident at the Chernobyl. It focuses on the immediate aftermath of the disaster and the cleanup efforts.[96](IMDb.com, 2018)

Chernobyl, (Poland 2015) - focuses on accounts of people affected by the disaster, describing live in the era and city [97](IMDb.com, 2015).

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[92] The Babushkas of Chernobyl IMDb.com [online]. Copyright 2015 © [cit. 23.04.2018]. Available at: https://www.imdb.com/title/tt3299704/?ref_=fn_tt_tt_17

[93] Chernobyl 30 Years On: Nuclear Heritage IMDb.com - [online]. Copyright 2015 © [cit. 23.04.2018]. Available at: https://www.imdb.com/title/tt5689446/?ref_=fn_al_tt_1

[94] The Russian Woodpecker (2015) – IMDb.com [online]. Copyright © 2015 [cit. 23.04.2018]. Available at: https://www.imdb.com/title/tt4082596/

[95] Life After: Chernobyl (TV Movie) – IMDb.com [online]. Copyright 2016 © [cit. 23.04.2018]. Available at: https://www.imdb.com/title/tt5653604/?ref_=nv_sr_1

[96] Chernobyl: Chronicle of Difficult Weeks (1990) - IMDb.com [online]. Copyright1990 © [cit. 23.04.2018]. Available at: https://www.imdb.com/title/tt7154796/?ref_=fn_tt_tt_70

[97] Chernobyl IMDb.com - [online]. Copyright © [cit. 23.04.2018]. Available at: https://www.imdb.com/title/tt5196166/?ref_=tt_rec_tti

La supplication (France/Luxembourg 2016) – a dramatization of Svetlana Alexievitch's book *Chernobyl Prayer* (IMDb.com, 2016). (see 5.1.1.)

Return to Chernobyl (Poland 2017) - made by the same authors as mentioned above, it focuses on the construction of the New Confinement [98] (IMDb.com, 2017). (see 2.3.3)

5.2.3. Fiction

Stalker (USSR, 1979)

The movie is set in an unnamed country with a prohibited and sealed of area called the Zone. It is supposedly inhabited by aliens and contains the Room, a place, where wishes are granted. Due to these rumours, people constantly attempt to enter the Zone. The protagonists: a writer, a professor, and their guide in the Zone a "stalker"). The Zone is depicted as a live, sentient organism, with thriving nature and many remnants of human population, which was created by an asteroid.

This movie has been regarded as a main inspiration for the creators of S.T.A.L.K.E.R series, which are set in the real Chernobyl Zone. The Zone in video games has many characteristics of Tarkovsky's Zone, with added concepts of radioactive fallout and other effects of the disaster.[99](IMDb.com, 2018)

Chernobyl: The Final Warning (USA, 1991)

One of the first fictional movies based on events of Chernobyl disaster. The plot interweaves the stories of a fireman at the nuclear power plant, his pregnant wife, and the government officials whose actions hinder rescue efforts of American Dr. Robert Gale, who leads the international medical team. The real Robert Gale (Jon Voight) published the original account of his experiences under the same title in 1988 [100](LA Times, 1991) [101](IMDb.com, 2018).

Surviving Disaster: Chernobyl Nuclear Disaster (UK, 2006)

An hour long episode featured in BBC docudrama series Surviving Disaster, which dramatizes and re-enacts the events surrounding the Chernobyl nuclear disaster [102](IMDb.com, 2006).

Chernobyl Diaries (USA, 2012)

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[98] Return to Chernobyl - IMDb.com [online]. Copyright 2017 © [cit. 23.04.2018]. Available at: https://www.imdb.com/title/tt6647448/?ref_=fn_tt_tt_12
[99] Stalker (1979) – IMDb.com [online]. Copyright 2018 © [cit.29.04.2018]. Available at: https://www.imdb.com/title/tt0079944/
[100] Profile : Jon Voight's Chernobyl 'Warning' - Featured Articles From The LA Times 1991 [online]. Available at: http://articles.latimes.com/1991-04-21/news/tv-590_1_jon-voight
[101] Chernobyl: The Final Warning IMDb.com [online]. Copyright © [cit. 23.04.2018] Available at: https://www.imdb.com/title/tt0101569/?ref_=fn_tt_tt_5
[102] "Surviving Disaster" Chernobyl Nuclear Disaster (TV Episode) – IMDb.com [online]. Copyright 2006 © [cit. 23.04.2018]. Available at: https://www.imdb.com/title/tt0775665/

A horror made by the authors of Paranormal Activity series. Six tourists hire an extreme tour guide who takes them to the Zone and the abandoned city Pripyat, Due to high levels of radiation; they are stopped by a military and sent back. The Guide finds an alternative route to the town, however they soon discover their van had been sabotaged and they are hunted by an evil spirit. It received mixed reviews by critics and audience [103](IMDb.com, 2012).

Road to Chernobyl (USA, 2013)

A dramatized reality-TV style of narration introduces a hip-hop recording artist and his three friends, who travel deep into the Chernobyl Zone to film his latest music video. Threatened by Russian mafia and irreversible effects of radiation, the cast aims to see the most of the Zone and to return home safely [104](IMDb.com, 2013).

5.2.4. Works by foreign authors

Innocent Saturday (orig. В субботу) (Russia, 2011)

Set right after the disaster in Chernobyl. A young man discovers the truth about the effects of the accident and tries to escape with his girlfriend, only to fail. Story deals with relationships and lethargy of other inhabitants, regarding the danger[105](IMDb.com, 2011).

5.2.5. Cartoons/Comics

There are no existing industry produced cartoons or comics, related directly to Chernobyl accident. Alas the theme of nuclear disaster and mutations has been used as a background or metaphor for social commentary before and even more after the Disaster.

Teenage Mutant Ninja Turtles (TMNT), (USA, 1984 – 2014)

American comic book series published by Mirage Studios was initially intended as a one piece work, but due to its popularity it turned into an ongoing series. The comic inspired a franchise of four television series, six feature films, numerous video games, and a wide range of toys and merchandise.

According to Nicky Falkof film series Teenage Mutant Ninja can be comprehended as a metaphor for the negative American responses to Chernobyl disaster. Despite numerous efforts to redeem nuclear energy as safe, irreplaceable source of energy for peaceful purposes, the fears of nuclear chaos were persistent and difficult to erase from the mind of American society. Such situation has been caused by lack of reliable information and past

[103] Chernobyl Diaries, IMDb.com [online]. Copyright 2012 © [cit.23.04.2018]. Available at: https://www.imdb.com/title/tt1991245/
[104] Road to Chernobyl IMDb.com [online]. Copyright 2013 © [cit. 23.04.2018]. Available at: https://www.imdb.com/title/tt4162372/?ref_=fn_tt_tt_26
[105] V subbotu (2011) – IMDb.com [online]. Copyright 2011 © [cit. 29.04.2018]. Available at: https://www.imdb.com/title/tt1838560/?ref_=nv_sr_1

representations of nuclear energy in fiction, which spurred number of myths and misconceptions and bolstered fears, caused by nuclear weapons.

TV series such as TMNT can be seen as the pop-cultural mean for repression of this irrational fear. Portraying five humanoid creatures, which were created by by-product of nuclear science, as heroes, who save the outside world from another disaster, while being feared, hated and repressed into hiding, due to their mutant "status", otherworldly appearance and lack of information on their true nature [106](Heroes with a Half Life, 2013).

5.2.6. References to Chernobyl in cartoons and comics

The Simpsons series (USA) – One of the main characters (Homer) works at a nuclear power plant and events unfolding around his job, had number of references to Chernobyl disaster, to other disasters, such as Three Miles Island or other problems related to nuclear energy, such as waste management and safety.

In Season 5 Episode 9 of "The Simpsons", "The Last Temptation of Homer". A protester at The National Energy convention shouts "No more Chernobyls"

In Season 7 Episode 7 of The Simpsons ("King-Size Homer"), Homer's boss Mr. Burns, while thanking Homer for saving the town, uses a phrase: "turning a potential Chernobyl into a mere Three Mile Island."[107](The Simpsons, 2018)

The disaster is the plot-driving element in Marvel Comics miniseries Meltdown, published in 1988 [108](The Impact of Disaster, 2015)

5.3. Video Games

S.T.A.L.K.E.R series (Ukraine, 2007 – 2009)

A series of first-person shooter survival horror video games, loosely based on the novel Roadside Picnic and its 1979 film adaptation Stalker (see 5.2.4.). The games are set in the Chernobyl area, in an alternative reality in which, special experimental labs were built in the Exclusion Zone, to enable experiments involving psychic abilities. These experiments resulted in the second explosion, causing various physical and meteorological phenomena,

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[106] FALKOF, Nicky. Heroes with a Half Life: Teenage Mutant Ninja Turtles and American Repression of Radiophobia after Chernobyl. The Journal of Popular Culture [online]. 2013, 46(5), 931-949 [cit. 2018-04-23]. DOI: 10.1111/jpcu.12061. ISSN 00223840. Available at: http://doi.wiley.com/10.1111/jpcu.12061

[107] *The Simpsons*, Groening, Matt, James L. Brooks, Sam Simon, Alf Clausen, Dan Castellaneta, Julie Kavner, Nancy Cartwright, Yeardley Smith, Hank Azaria, and Harry Shearer. Copyright 2007.

[108] BOHN, Thomas M., Thomas. FELDHOFF, Lisette. GEBHARDT a Arndt. GRAF. The impact of disaster: social and cultural approaches to Fukushima and Chernobyl. pp 199-205, Berlin: EB-Publishers, 2015. ISBN 978-3868931662.

such as severe mutation in humans and animals, serious radioactive fallout and creation of elemental entities called “anomalies”, entities producing valuable artefacts, which give the possessor special abilities. Artefacts are valuable commodity and thus the Zone attracts ambitious people known as “Stalkers”, who are divided into various factions, differing in their goals and philosophies. Generally, the ultimate objective of each game involves reaching the centre of The Zone. The ending is based on multiple factors and choices during the gameplay.

The series contains 3 games:

S.T.A.L.K.E.R.: Shadow of Chernobyl (2007)

S.T.A.L.K.E.R.: Clear Sky (2008) – a prequel to Shadow of Chernobyl

S.T.A.L.K.E.R.: Call of Pripyat (2009) – a sequel to Shadow of Chernobyl

All games in the series received mostly positive reviews from popular gaming websites, such as IGN.com, Gamespot, Metacritic and became commercially successful in Russia, Europe and the USA. As of 2010 over 4 million copies has been sold worldwide[109] (soc.stalker-game.com, 2010).

Chernobyl: Terrorist Attack (Germany, 2011)

A low budget, first-person shooter set in city Pripyat and its surroundings, which were conquered by terrorists, who threaten to detonate Chernobyl power plant, unless being paid aransom. It received unfavourable reviews, due to faulty game mechanics.

Metro: Video game series (Ukraine, 2010 – present)

A first-person shooter developed by former programmers of S.T.A.L.K.E.R series both games received favorable reviews from critics and high rankings. Game has gained notable popularity, especially in Russia, Eastern Europe and Germany. Special Collector’s editions were released for aforementioned countries [110](PC Gamer, 2014). Deep Silver announced that the Metro Redux collection sold more than 1.5 million copies by 2013. And both games were commercially successful in the UK and the USA.[111](GamesIndustry.biz, 2013) [112](Eurogamer.com, 2013)

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[109] Description - S.T.A.L.K.E.R., GSC Game world. [online]. Copyright 2007 - 2018 © [cit. 23.04.2018]. Available at: http://soc.stalker-game.com/?page=game

[110] Metro 2033 Redux review | PC Gamer. PC Gamer [online]. Copyright © [cit. 23.04.2018]. Available at: https://www.pcgamer.com/metro-2033-redux-review/

[111] Metro: Last Light replaces Dead Island Riptide as UK No.1 GamesIndustry.biz [online] [cit. 23.04.2018]. Copyright 2013. Available at: https://www.gamesindustry.biz/articles/2013-05-20-metro-last-light-replaces-dead-island-riptide-as-uk-no-1

[112] Metro: Last Light sold more units in one week worldwide than its predecessor did in three months • Eurogamer.net. Eurogamer.net [online]. Copyright © 2018 Gamer Network. [cit. 23.04.2018]. Available at: https://www.eurogamer.net/articles/2013-06-01-metro-last-light-sold-more-units-in-one-week-than-its-predecessor-did-in-three-months

Metro 2033 (2010)

The game is based on Dmitry Glukhovsky's book Metro 2033 and follows the book's storyline and setting. (see 5.1.4.)

Metro: Last Light (2013)

The sequel to the Metro 2033 is a post-apocalyptic, first-person shooter videogame with stealth, horror and survival elements. It unfolds on the premise of "bad ending" in previous game. Storyline is written by the author of books, D. Glukhovsky.

Hero from the previous game is forced to venture into different parts of the Moscow metro system, and even on the surface, escaping dangers of radioactive gases and fights against different factions and mutated monsters [113](Games.cz, 2013).

Metro: Redux (2014) – an improved, stabilized versions of both games, with all additional content, sold as a package.

Metro: Exodus (in development, announced 2018)[114](TrustedReviews, 2018).

5.4. Visual arts

5.4.1. Photography

Listed below are notable photographers and publicists, who shared extensive collections of photographs, related to the Zone.

Igor Kostin, a Ukrainian photographer took one of the first pictures of the destroyed Chernobyl nuclear plant after it exploded in 1986, and documented the whole operation. These photographs were later published in his book *Chernobyl: Confessions of a Reporter* (see), and his camera footage was used in documentary *the Battle of Chernobyl.* (see)

Photographer **Elena Filatova** (2004) published a photo-essay of her solo rides through the Zone. The website was later revealed to be a hoax, on the grounds that Filatova took photographs on a guided tour or from other unaccredited sources.[115](LA Times, 2004)

Andy Dan, a British photographer released a collection of photographs from his visit in the Zone, which he used in his commentary on the authenticity of photographs taken in Pripyat, after it has become a popular touring site. He suggests that: *"much of the site is in a "carefully*

[113] Metro: Last Light - recenze PC verze - Games.cz. [online], translated. Copyright © 1996 [cit. 23.04.2018]. available at: https://games.tiscali.cz/recenze/metro-last-light-recenze-pc-verze-62844
[114] Metro Exodus release date, gameplay, trailer, story info and all the latest news | Trusted Reviews.[online]. Copyright © Time Inc. [cit. 23.04.2018]. Available at: http://www.trustedreviews.com/news/metro-exodus-release-date-gameplay-news-trailer-story-preorder-2952446
[115] Account of Chernobyl Trip Takes Web Surfers for a Ride Featured Articles From The La Times 2004 [online]. [cit.23.04.2018]. Available at: http://articles.latimes.com/2004/jul/06/world/fg-chernobyl6

managed state of decline" whereby the imagery perpetuates "a popular myth which paints Pripyat as some kind of profound time capsule. [116](Andy Dan, Fstoppers, 2017*)".*

A number of sharing websites, specialized on photographs from the Zone has been established such as: The Chernobyl Gallery[117](The Chernobyl Gallery, 2018) or specialized touring companies providing guiding and workshops for photographers in the Zone. [118](chernobylphoto.com, 2018)

5.4.2. Graffiti in Pripyat

Painted by unknown authors on different buildings in Pripyat, they depict former inhabitants, especially children or paranormal entities and shadows. Their appearance has been received ambiguously, as either desecration of the place or a new form of street art, which attracts tourists.[119](ukrainetrek.com, 2013)

5.5. Humour and Digital sources

5.5.1. Jokes and Satire

In comparison with the older types of jokes, about politics or life situations, which could be easily altered to fit the region, political state or time, the Chernobyl jokes are considered to be very time and place specific. First jokes appeared as soon as the first information reached the public, on the May Day (1 May) celebrations and their popularity lasted until the end of 1986. They ranged from more general to jokes taking inspiration in various other events, taking place in that time period, many of those jokes originated in Soviet countries and are thus related to their settings. Below are examples of jokes on most prevalent topics [120](The Politics of Joking, 1988).

Radiation glow

„What's the new greeting among comrades?

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[116] Is Every Photograph From Chernobyl a Lie? | Fstoppers. [online]. Copyright ©2018 Fstoppers [cit.27.04.2018]. Available at: https://fstoppers.com/documentary/every-photograph-chernobyl-lie-204470

[117] Chernobyl Gallery. Chernobyl Gallery.com [online]. [cit.23.04.2018]. Available at: http://chernobylgallery.com/

[118] Chernobyl Photo:Tours Linon Digital [online] Linon Digital Copyright 2018[cit. 23.04.2018] Available at: http://www.chernobylphoto.com/tours/

[119] Graffiti of Pripyat – the ghost town · [online] Ukraine travel blog. Copyright 2018[cit. 23.04.2018]. Available at: http://ukrainetrek.com/blog/art/graffiti-of-pripyat-the-ghost-town/

[120] LASZLO, Kürti. *The Politics of Joking: Popular response to Chernobyl*. Journal of American Folklore [online]. 1988,, 325 - 334 [cit. 2018-04-27]. Available at: https://www.researchgate.net/profile/Laszlo_Kurti2/publication/265937172_Chernobyl_Jokes_1988/links/542178250cf2ce3a91b77eac/Chernobyl-Jokes-1988.pdf

How are you?
Glowing."

"Why are the Chernobyl girls the prettiest?
Because they're glowing."

"What's the new shopping craze?
To save money people buy Kiev bread instead of fluorescent light bulbs."

"How many Ukrainians does it take to screw in a light bulb?
None, they don't have to, they're all glowing.
[121](The Politics of Joking, 1988)"

Media coverage and panic

"What were the first two announcements concerning radiation?
The first: There is no radioactivity. The second: The radioactivity during the second week has subsided considerably, being only one half of the first week's."

"Did you see the new ad in the papers?
Exchange a 7-day excursion to the Ukraine for a 1-day excursion to Münich. Will pay the difference."

"New ad in the newspaper: Will sell a fully furnished villa with a swimming pool near Chernobyl. Very private." [122](The Politics of Joking, 1988)"

"What's the best anti-radiation device in Eastern Europe?
TASS, the official Soviet news agency."

"What is the best way to deal with radiation, comrade?"
Just wrap yourself in a white sheet and slowly crawl to the nearest cemetery.
Why slowly?
Not to create panic.
[123](The Politics of Joking, 1988)"

Events and Sports
The major events taking place soon after the accident were the May Day celebrations, the "Peace Bicycle Race" held on 6 May and "Victory Day" celebrated on 9 May, which received an extensive coverage in media, to shift attention away from Chernobyl disaster and persuade public, that situation is under control.

"What's the first prize of the Kiev-Warsaw-Berlin Peace Bicycle Race?
Free bone- marrow transplant."

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[121] ibid
[122] ibid
[123] ibid

"What's the new name of the Peace Bicycle race?
Tour de Madame Curie"

"What's the new route of Peace Bicycle Race?
Hiroshima-Nagasaki-Kiev"

"Did you hear about the new rider in the Peace Bicycle Race?
No, what's his name?
Leadman."

"How did the workers march in Kiev during the May Day parade?
With much activity."

"How was the May Day parade organized?
In rows. In the first row were the party activists, in the second were all the youth communist activists, in the third all the union activists, and finally all the radio activists.
[124](The Politics of Joking, 1988)."

Politics and Names

"What does U.S.S.R. stand for?
Union of Soviet Radioactive Republics."

"The U.S. has declared itself under unilateral obligation not to attack the U.S.S.R. first, by means of any of its nuclear reactors."

"Which is the stronger and more powerful, the U.S.A. or the U.S.S.R.?
The U.S.S.R, because it was able to deliver the biggest blow on Eastern Europe so far."

"What will they call Gorbachev in the history books after Chernobyl?
First Isotope."
[125](The Politics of Joking, 1988)."

Have you ever seen Ronald Reagan's response to the Chernobyl incident?
He thought the Russians were just "overreacting."

Mutations and Health

"What's the new sign in Kiev hospitals?
"Anyone coming for radiation therapies please go outside.[126](The politics of Joking, 1988)"

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[124] ibid
[125] ibid
[126] LASZLO, Kürti. *The Politics of Joking: Popular response to Chernobyl*. Journal of American Folklore [online]. 1988,, 325 - 334 [cit. 2018-04-27]. Available at: https://www.researchgate.net/profile/Laszlo_Kurti2/publication/265937172_Chernobyl_Jokes_1988/links/542178250cf2ce3a91b77eac/Chernobyl-Jokes-1988.pdf

"Boy: Grandad, is it true that there was a big nuclear disaster called Chernobyl?
Grandad: Yes.
(He pats the boy's head).
Boy: Is it also true that nobody was harmed?
Grandad: Yes, it's true.
(Pats the boy's other head) [127](reddit.com, 2013)."

Food

„A physicist visits Chernobyl and is surprised to find an old peasant woman tending a vegetable stand.
The physicist asks her who in their right mind would buy fresh vegetables from Chernobyl?
She replied "Why, anybody! You, for instance. Perhaps you'd like some beautiful tomatoes for your ex-wife? A bag of apples for your boss?"

„Lacks feathers, glows at night and flies What is it?
Chicken Kiev
"[128](reddit.com, 2013)"

Other

„A nuclear plant, a windmill and a solar panel are at a party, and the nuclear plant is getting all the attention from the hottest girls. Jealous, the windmill and solar panel ask the nuclear power what his secret is. Naturally, the atomic power player says "Well, Mr. Windmill, you're just spinning your wheels in place and blowing a lot of air getting nowhere, and you Mr. Solar Panel, you suck up all the light and your character is very flat. On the other hand, I am the bad boy every hottie loves: I'm dangerous, I'm toxic to the core, I'm hard to handle, and my charm is radioactive."

„If you fish near Three Mile Island, Chernobyl or Fukushima, be sure your fishin' trip does not turn into a fission trip."

„If it weren't for radioactive mutations and nuclear power plants, Marge Simpson wouldn't have three-eyed fish to feed Mr. Burns and Homer would be unemployed."
[129](thedailydose.com, 2011)"

The American approach to humour and Chernobyl has been rather similar and for a short time it became a popular topic with stand-up comedians. Examples below are from a survey done by La Times in 1986.

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[127] Chernobyl jokes thread [online]. Copyright © 2013 Reddit, Inc. All rights reserved [cit. 27.04.2018]. Available at: https://www.reddit.com/r/nuclear/comments/w5lu0/chernobyl_jokes/
[128] ibid
[129] The Daily Dose 2011 Archives. [online]. Copyright © 2011 [cit. 27.04.2018]. Available at: http://www.thedailydose.com/archives/2011/the-daily-dose-Tuesday,_2011-05-31,_10:03.html

"At first, the Russians claimed that only two people died as a result of the disaster. Maybe so at first. The two people who died were the guys who had to bring the news of the disaster to Gorbachev." (Argus Hamilton)"

"But don't feel sorry for the Soviets, folks, they'll make the most of this. All that radioactivity will mix with their steroids and they'll win the three-legged race in the '88 Olympics."(Argus Hamilton)"

„The Russians aren't much help for themselves, are they? Between 2 and 2,000 people dead? You can see the guy building their reactor: "Is that 6 3/4 inches or 5 feet, Boris? Oh, if there's a crack, just throw some caulking in there. A little stucco should do it, Boris." (Yakov Smirnoff)"

"They said there's a new form of medical care in the Soviet Union. They give X-rays to everyone in same time." (Yakov Smirnoff)"
[130](LA Times, 1986).

5.5.2. Cartoon jokes

(See Appendices 3 – 7)

Appendix 3 – a cartoon by Patrick Chappotte for International Herald Tribune.
Appendices 4, 6 –take on presumed genetic mutations
Appendix 5 – is related to plans on rebuilding former power plant into solar power plant.
Appendix 7 – wordplays with terminology on well-known dishes

5.5.3. Memes

They are humorous items, most commonly defined as: *an image, video, piece of text, etc., typically humorous in nature, which is copied and spread rapidly by Internet users, often with slight variations* [131](en.oxforddictionaries.com, 2018).

They are a newer kind of popular culture goods. Many of memes related to Chernobyl are also related to previous works influenced by Chernobyl, especially videogames, or comment on the most prevalent ideas related to Chernobyl disaster in today's society. They are considered less time and place oriented, than earlier jokes. (See 5.5.1.)

"Countryballs" – is a spin-off meme from Polandball meme. Countryballs were created on October 15 2009; Characters have no limbs, pupils, and mouth. Each ball represents a country

[130] Chernobyl Jokes Mushroom – pp. 1-2 –. [online] LA Times Copyright 2018 [cit. 27.04.2018].. Available at: http://articles.latimes.com/1986-05-18/entertainment/ca-20894_1_chernobyl-accident/2
[131] meme | Definition of meme in English by Oxford Dictionaries. English [online].Copyright © 2018 Oxford University Press [cit. 27.04.2018]. Available at: https://en.oxforddictionaries.com/definition/meme

in a very stereotypical manner regarding its behaviour, including an erred use of English by non-natives [132](knowyourmeme.com, 2009).[133]

"Meanwhile in...X" – is series of memes based on the phrase "Meanwhile in…," a phrase, which serves as an easy switch in-between two concurrent events in different places. In memes it is used to illustrate ridiculous and absurd situations, which are considered stereotypical for certain nationalities or subcultures [134](knowyourmeme.com, 2009). [135]

"Chernobyl after The Nuclear Explosion: Full documentary" – is a small series of memes, presenting, pictures of animals or people, altered to look abnormal presented as an official documentary. [136]

Get Out of Here Stalker – is a meme inspired by the S.T.A.L.K.E.R series. Aforementioned phrase is said by NPC characters, which are not willing to speak to the player (knowyourmeme.com, 2010).[137]

Other[138]

Appendices 23 – 26 – are inspired by augmented genetic changes caused by radiation
Apendix 28 – a spin-off of Meanwhile in.. meme.
Appendix 29 – reference to stray dogs living in the Zone and S.T.A.L.K.E.R series
Appendix 30 – a spin-off of Hurricane Irene meme

5.6. Disaster Tourism

It can be defined as an act of purposely travelling to places affected by various disasters, or warfare. Disaster tourism is often regarded as a type of [139]Dark tourism. First tourists appeared around 1995, after the level of radiation had decreased to a safe amount. During those years, the only legal tours of the Zone were provided by organization "Chernobylinterinform", and the site became especially popular among tourists from USA and Western Europe. Eventually the Zone has become one of the best known disaster destinations, which attracts more tourists every year and furthers the popularity of disaster tourism. The Zone was officially proclaimed as a tourist site in 2011, just before the UEFA Euro 2012 football tournament, to test Zone's economical potential, which proved to be sufficient [140](Current Issues in Tourism, 2014).

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[132] Know your meme: Polandball. Knowyourmeme.com [online]. Copyright © 2018 [cit. 27.04.2018]. Available at: http://knowyourmeme.com/memes/polandball
[133] (See appendices 8-10)
[134]Know your meme: Meanwhile in..x [online].knowyourmeme.com 2018 [cit. 27.04.2018].Available at: http://knowyourmeme.com/memes/meanwhile-in
[135] (See Appendices 11-16)
[136] (See appendices 17 – 19)
[137] (See appendices 20 -22)
[138] (See Appendices. 23 – 30)
[139] A type of tourism, involving travel to places associated with death and tragedy
[140] YANKOVSKA, Ganna a Kevin HANNAM. Dark and toxic tourism in the Chernobyl exclusion zone. Current Issues in Tourism [online]. 2014, 17(10), 929-939 [cit. 2018-04-28]. DOI: 10.1080/13683500.2013.820260. ISSN 1368-3500. Available at: http://www.tandfonline.com/doi/abs/10.1080/13683500.2013.820260

6. Chernobyl in Popular Culture of the Czech Republic

Czech Republic is one of the countries affected by both the radioactive fallout and Soviet regime. Thus it is safe to assume, that the effects of the Chernobyl disaster on its popular culture, had been similar to effects on other post-Soviet countries and in broader outlook same as anywhere in the Western world. Listed below are works made by Czech authors related to Chernobyl accident.

Tajemný Černobyl (2015) – a report made by journalists of Barrandov TV, which includes interviews with Pripyat's former mayor Alexander Esaulov and former inhabitants. It received low ratings for lacking production and skill[141](ČSFD.cz, 2018).

Prázdniny v Černobylu (2015) – Photographer Václav Vašků documented one of his visits of the Zone, collecting interviews with people affected by the disaster inside and outside of the Zone [142](ČSFD.cz, 2018).

Photographers

Antonín Kratochvíl – Czech-American photographer, the founder of most prominent Czech company organizing photography workshops in the Chernobyl Zone.

Václav Vašků – a former journalist and a photographer, who intensively studies the Chernobyl disaster and presents his results not only through photography, but also through his articles and introductions for various exhibits. His main focus are former and current inhabitants of the Zone and their life stories [143](Fotografové Černobylu, 2014).

Jokes

The most popular ones at the time of disaster were either translated or altered versions of the jokes mentioned in (6.2.1.). Below are examples of Czech jokes, used today.

Ukrajinští vědci našli způsob využití poštovních schránek z Černobylu.
Prodávají je Polákům jako mikrovlnné trouby!

Víte, čím se řídí v Černobylu?
Víc hlav, víc rozumu.

[141] Tajemný Černobyl (TV film) (2015) | ČSFD.cz. [online]. Copyright 2018 © Archiv TV Barrandov [cit. 28.04.2018]. Available at: https://www.csfd.cz/film/202588-tajemny-cernobyl/prehled/
[142] Prázdniny v Černobylu (2015) | ČSFD.cz. [online]. Copyright 2018 © Petr Nesnídal [cit. 28.04.2018]. Available at: https://www.csfd.cz/film/433959-prazdniny-v-cernobylu/prehled/
[143] VAŠKŮ, Tereza. Fotografové Černobylu [online].Slezská univerzita v Opavě 2014, [cit. 2018-04-28]. Available at: http://itf.cz/dokumenty/fpf-bp-14-fotografove-cernobylu-vasku-tereza.pdf

Právě teď vydaly přední světové agentury prohlášení, které uvádí na pravou míru předchozí zprávy o údajném asteroidu, který se měl srazit v roce 2019 se Zemí. Nejedná se o žádný asteroid, ale o vrátnici z Černobylu!

Rozhovor: „Jsem slyšel, že při Černobylu zařvali jen dva lidi."
„Fakt?"„Jeden řval: Vypni to! A druhý: Nejde to!"
[144](iVtipy.cz, 2009)

7. Survey

Regarding the other types of pop cultural goods, Czech Republic has never been regarded as a prominent producer of works, related to Chernobyl disaster and rarely any have been acknowledged by foreign press. To obtain better view of Czech approach to this topic, I have conducted a survey, concerning the general acknowledgment of the accident and works related to this topic, as well as obtaining general opinion of Czech public on the use of nuclear energy. 76 entries yielded following results:

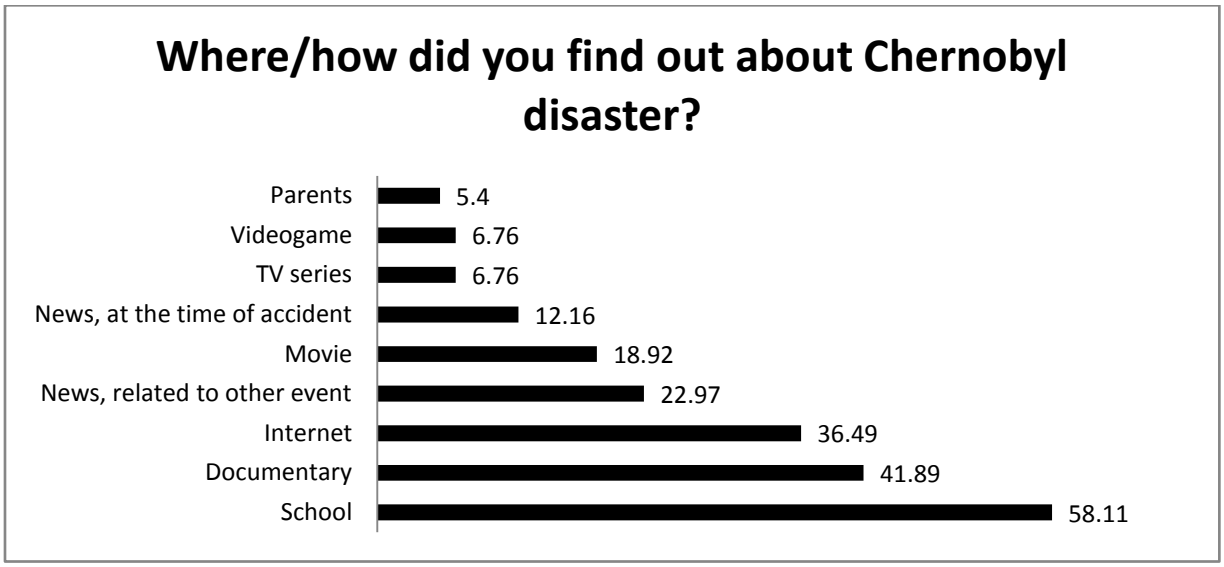
54 (71,05%) respondents were women, 22 (28,95%) respondents were men. The majority of respondents were between 20 to 30 years old (60,53%), followed by groups of 30-40 and 15-20, both having margin of 13,16% and group of 40-50 years of age with 7,89% margin.

In question: Have you ever heard of Chernobyl nuclear disaster? 74 respondents (97,37%) answered **YES**

The means of getting the information about the disaster varied, the most prevalent were School, Documentaries and Internet media, which indicates a degree of influence of Chernobyl on Czech popular culture as shown in the *Graph 1*

[144] Vtipy o Černobylu - 15 vtipů. iVtipy.cz [online]. Copyright © 2009 [cit. 28.04.2018]. Available at: https://www.ivtipy.cz/vtipy-o-cernobylu/

Graph 1



Question 4: What words/terms/connotations are on your mind, when you encounter a work of art or medium, related to topic of Chernobyl? (The answers had been pooled for purposes of this thesis.)

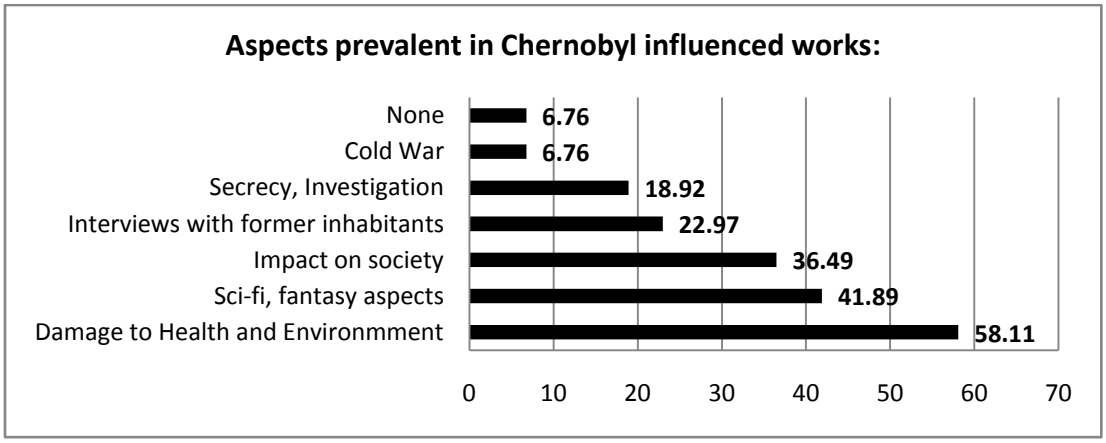
Most prevalent entries by their popularity:

1.) Death, Horror, Sadness, Catastrophe
2.) Radioactivity, Explosion, Panic,
3.) Mutants, Monsters, Sci-Fi
4.) Secrecy, Manipulation
5.) Diseases, Disabled, Irradiation
6.) Ghost city, Damaged landscape

Mentioned works: S.T.A.L.K.E.R series and its fan-made videos, Metro series, Chernobyl Diaries, Chernobyl Prayer, Zero Hour: Disaster at Chernobyl Photographs, Graffiti.

52,63% of respondents said, they **have** encountered an pop cultural item, related to Chernobyl disaster or set in the area of the Zone. Most common types of media were: Documentaries, Movies, Jokes/Internet media, Videogames and Non-fictional literature.

Question 7: In your opinion, what topics/aspects are most prevalent in such works? Yielded following results:



Questions, regarding the opinion on the amount of influence Chernobyl disaster had on British-American, Czech and Eastern European pop culture, gave rather mixed results. According to respondents, Eastern European pop culture had been more influenced than the Czech and British-American, which were around the same median, although opinions on degree of British-American pop culture being influenced varied significantly more than opinions regarding the Czech pop culture.

Questions regarding the use of nuclear energy also yielded mixed results, showing that public's opinions on safety and harmfulness of nuclear power plants are represented on both sides of the spectrum, leaning more towards the negative approach. The only aspect of nuclear energy, rated as predominantly positive, was its potential and importance.

8. Conclusion

The Chernobyl nuclear disaster, being recognized as a biggest nuclear disaster to this day, had striking effects on the popular culture across the Western world, varying slightly in the amount of influence and ways of their manifestation in the local popular culture. The scale of this disaster, its lasting consequences, thorough media coverage and growing globalization caused these influences and prominent aspects of the Chernobyl disaster to become more universal for both Europe and the USA. This state can be attributed to the economical and political position of the USA. The USA is the biggest producer of popular culture goods, thanks to its well developed entertainment industry and successful economy. The political position of USA, as one of the leading world powers, in turn enables them to export their values and opinions through popular cultural goods easily and effectively, influencing perception of foreign countries on various issues. The UK does not produce the amount of popular culture goods as the USA, and thus its influence on popular culture of other countries is marginally smaller and more localized. Despite these economical differences, the British popular culture in ratio with its production is regarded as very influential and successful in exporting British views and culture, especially into other European countries.

Regarding the singular aspects of Chernobyl accident, which became prevalent in British and American popular culture, a certain type of evolution can be observed, related mainly to

political changes and physical changes in the Chernobyl area, as well as to changes related to natural evolution of society and technologies over time. In the first years after the Disaster, the political aspects and the lack of adequate information were notable influences, bolstered by tensions of the Cold War and hardships of proposed political and economical changes in the USSR. As the political systems in Europe changed, these influences eventually diminished, since they were no longer relevant. Among other highly influential aspects were the societal and health consequences, which are relevant and researched to this day, although in different manner, than in the past. In the years following the Disaster, the re-settlement and immediate health consequences were the main concerns and this was reflected in the popular culture. These concerns eventually shifted to be more people oriented, searching for truth in the stories of former inhabitants, victims and those who came back to live in the Zone and documenting them. Myths and misconceptions, which appeared at first due to lack of information and fear of unknown, intangible enemy, were later studied and proved to be false in large. The efforts changed the public opinion on the real scale of Chernobyl consequences, and thus products of these myths are nowadays used in works of art more often than ever before. Being based on some of the real consequences, but augmented to the point of fantasy or science-fiction. This aspect seems to be the most prevalent and popular in the present popular culture, being a part of works of fantasy literature and videogames. In other types of fictional Chernobyl influenced works, Chernobyl disaster is mostly used as a setting for the story, without any deeper connection to the real Disaster and its consequences. Influences on Humour were mostly similar to those of Eastern Europe, with the exception of political satire, which was more prevalent in the Eastern bloc's humour, in the early years of the disaster. The popularity of Chernobyl humour had diminished fast, with occasional comebacks related to different events, such as the Fukushima disaster.

The question of difference in influences among various nations would require further research, among number of nations to yield reliable results. From my observation and data gathered through survey, all of the major influences were present in all of the European countries and USA, even if they were not affected by Chernobyl directly. The most popular current pop cultural items are recognized worldwide, with slight prevalence of popularity in the Eastern European countries, with regards to videogames or post-apocalyptic/sci-fi literature. Works popular in other most of the European countries are of either American or Russian/Ukrainian origin.

9. Résumé

This thesis deals with the Chernobyl disaster and how it influenced British and American popular culture. Thesis provides extensive information about the background of the Disaster and its effects on Politics, Nuclear Energy, Health and Environment, Society and popular Culture. Thesis includes a list of notable works of art and pop cultural items, produced by British/American authors and mentions of notable works from foreign authors. The thesis provides examples of other art forms, such as Visual art and Humour. The last part of the

thesis is dedicated to Chernobyl influenced popular culture in Czech Republic, accompanied by survey. The aim of this thesis is to define: what aspects were/are the most prevalent in British/American popular culture, existence of noticeable differences in influences in other countries and the position regarding the production of popular culture goods.

Следующая дипломная робота занимается темой: Авария на Чернообыльской АЭС и её влияние на популярную культуру Великобритаии и США. Робота предоставляет важные информации о Чернобыльской Зоне, о аварии на АЭС, причинах, последтвиах и о её влияниях на политику, окружащую среду, здоровие, общество и популярную култиру. Вторая часть роботы содержает список значительных литературных и аудиовизуальных робот от Британских и Американских авторов, касающихся Чернобыльской аварии и её последствий, и робот помещенных в Чернобыльскую Зону. Знечительные роботы авторов других национальностей тоже находиться в списке. Последная часть дипломной роботы посвящена влиянию Чернобыльской аварии на Ческую популярную культуру, эта часть сопровождена списком робот ческих авторов и ресультатами анкеты на соответствующую тему. Целью дипломной роботы является: Определение самых знаительных аспектов, влиявших на Британскую и Американскую популярную культуру. Коментирование позиций, занимаемых етими странами в мировой продукции товароб популярной культуры и исследовать розличия между влияними на попкультуру других стран в сопоставлении с Великобританией и США.

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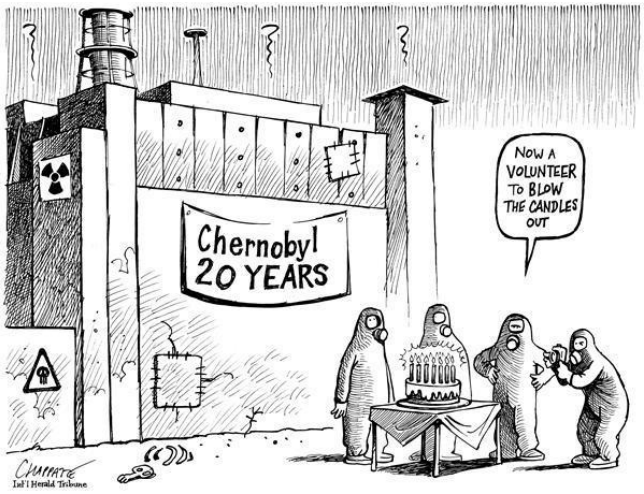

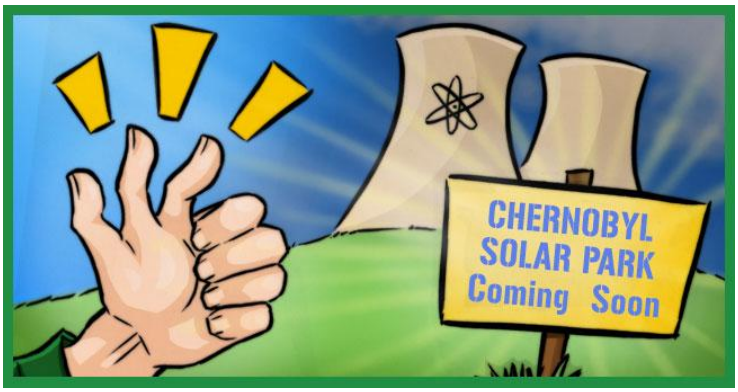

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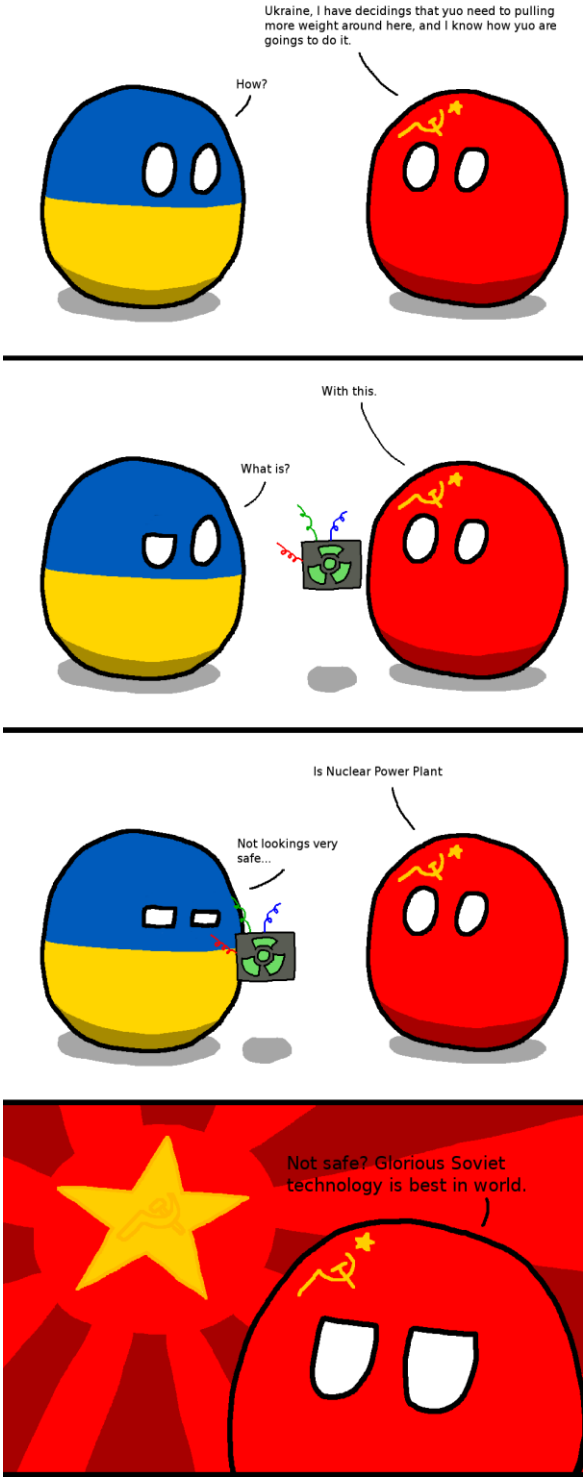

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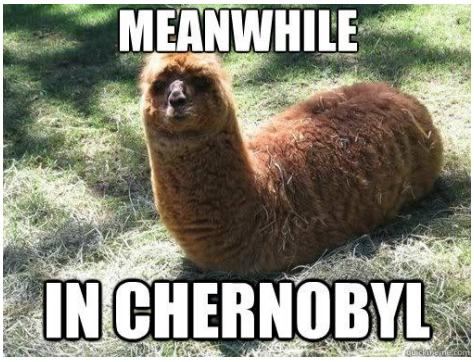

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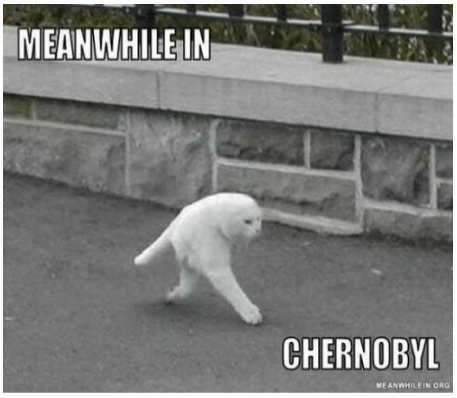

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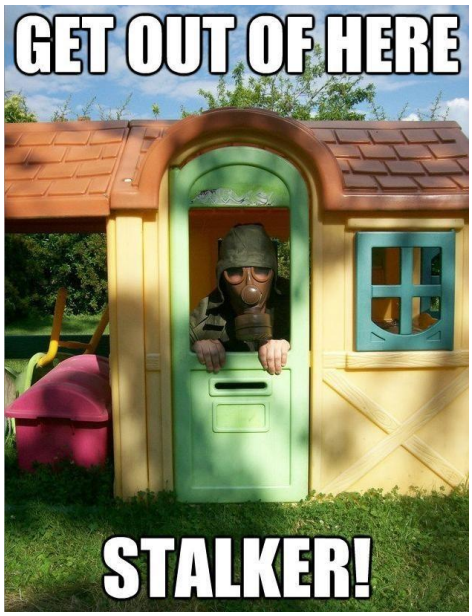

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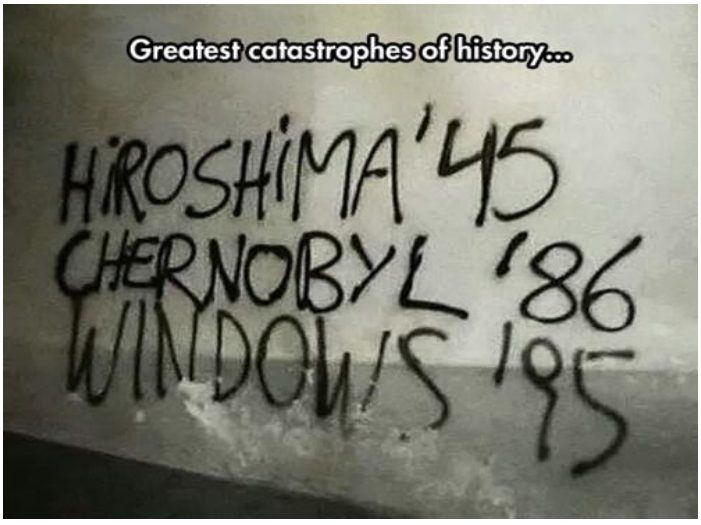

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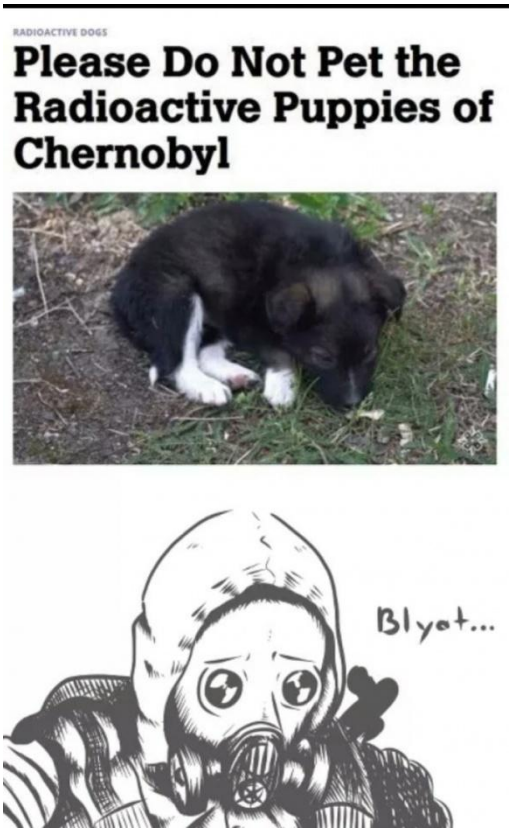

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