OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION

#RadiationReimagined
Strategic Communications Report

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Problem and Opportunity Statement

Radiation is defined as energy given off by matter in the form of rays or high-speed particles (United States Nuclear Regulatory Commission, 2017). Scientists have been studying radiation since the late 18th century. Exposure to low levels of radiation- from 5,000 to 10,000 millirem- produces no harmful effects (Nuclear Energy Institute, 2015). Despite the fear of ionizing radiation, scientists have discovered smaller effects on those exposed to radiation from atomic weapons than traditionally believed. A long-term study of post-World War II Japanese atomic bomb survivors determined that of the 10,929 people exposed to radiation who died from cancer, only 527 died as a result of the radiation itself. This research also allowed scientists to determine that radiation doses below 100 millisieverts cause no elevations in rates of illness or disease (Ropeik, 2013). The majority of Fukushima survivors were below this threshold. The World Health Organization determined that following the Chernobyl nuclear disaster, psychological effects caused far more damage to survivors than exposure to radiation itself (World Nuclear Association, 2016). The stress and fear surrounding radiation exposure should not be taken lightly, yet a clear separation exists between the amount of damage people believe radiation can cause and the effects it actually has on people's health.

Radiation is also naturally occuring. Elements like uranium and potassium are found in nature, meaning the average person accumulates a certain amount of radiation exposure over their lifetime. For example, bananas contain the radioactive element potassium-40, and airplane passengers are exposed to cosmic radiation from the sun (United States Nuclear Regulatory Commission, 2017). However, these harmless instances are rarely discussed in the media or public discourse, leading the public to believe that radiation is associated primarily with negative events like nuclear accidents.

An opportunity exists for both communications professionals and scientists to guide the narrative of radiation away from its negative associations and towards a more comprehensive understanding of the little risk involved in everyday exposure. An educational campaign will ensure that key publics recognize everyday exposures to radiation and the true risk behind varying levels of radioactive material.

Situation Analysis

Background on the issue

Fear of radiation stems from its association with commercial nuclear energy accidents and global use of atomic weapons beginning in the 1940s. The Campaign for Nuclear Disarmament in the United Kingdom and other peace movements during the 1960s focused on the dangers of ionizing radiation and closely connected these sentiments to environmentalist ideals (Ropeik, 2017). Attention later shifted to the Pennsylvania Three Mile Island nuclear accident in 1979, which resulted in necessary regulations and criticisms of the nuclear energy industry, yet no link between the incident and cancer rates in the area has been found. During the Chernobyl disaster of 1986 in the Ukraine, an explosion in a reactor at the nuclear power plant killed 30 people and released radioactivity into the atmosphere. Fear of radiation spread rapidly during this time, yet this disaster represents the only commercial nuclear power incident in which radiation-related deaths occured (World Nuclear Association, 2016).

Nuclear power plant operators and flight attendants are exposed to higher levels of radiation over their lifetimes than the general public, yet no negative health effects have been observed as a result. According to the Nuclear Energy Institute, "The NRC prescribes and enforces limits on the amount of radiation that workers and members of the public can receive from nuclear energy facilities. The annual limit for occupational exposure is 5,000 mrem. The average nuclear energy facility worker receives 101 mrem. The average member of the public receives less than 0.5 mrem per year from the entire nuclear energy fuel cycle combined, including uranium mining, fuel fabrication, nuclear power generation and waste disposal (Nuclear Energy Institute, 2015)."

While incidents resulting from nuclear power plant failures are rightfully considered dangerous, a number of activities, occupations and materials are associated with harmless radiation. People come in contact with radiation, often unknowingly, on a day-to-day basis. Common medical procedures like X-rays and CT scans are sources of radiation exposure. According to the Nuclear Energy Institute, "A typical medical X-ray (single exposure) provides a dose of 10 mrem, while a single CT scan typically provides a dose of 1,000 mrem (Nuclear Energy Institute, 2015)." Naturally-occuring forms of radiation include elements like potassium, uranium and thorium (Oak Ridge Institute for Science and Education). These materials are found in the air, the earth's crust, and in the food we eat. Bananas give off one microsievert of radiation. In order to die from a single exposure to radiation from bananas, one would have to eat ten million bananas at once, according to Physician Ramzi Amri (Amri, 2016). Cosmic radiation from the sun and stars steadily reaches earth. Soil and rock contain radioactive materials like uranium and thorium, and air contains radon, which makes up most of the dose Americans receive from naturally occuring sources each

year (United States Nuclear Regulatory Commission, 2017). These exposures are relatively harmless, yet a fear of radiation still lingers.

Risk perception studies provide insight as to why fear of radiation persists. Psychological qualities lead the human brain to analyze fear as a feeling, rather than a complete analysis of the facts presented. Other psychological characteristics pertaining to radiation include the fact that we worry more about human-made risks than natural ones. This may explain why people are generally less concerned with naturally-occurring radioactive material than nuclear power production. We also worry about things that are difficult to detect and understand, like the invisibility of radiation exposure and complicated processes of atomic energy (Ropeik, 2017).

Consequences of the situation

The nuclear energy industry still struggles to maintain public and political support due to its inevitable association with radiation. According to a Gallup poll from 2016, over half of those surveyed (54%) opposed nuclear energy (Gallup, 2016). Like renewable energy, nuclear power produces clean energy without releasing any carbon dioxide into the atmosphere. There is enormous potential for nuclear energy to aid in environmental efforts, however political and economic factors have allowed the United States' nuclear plants to close consistently over the years as countries like China and Russia build more. Fear of radiation may be contributing to our grid becoming more fossil-fuel reliant and less committed to clean energy sources.

Resolution of the situation

Radiation allows patients to receive medical treatment. It also allows us to power our world with nuclear energy. We are exposed to radiation during moments that bring us joy, such as eating a ripe banana as a snack or traveling by plane to visit relatives. Communicating these sentiments to key publics while educating them on the basic risks and non-risks will effectively change the narrative of radiation. Delivering accurate, empirically-based benefits and risks of radiation is an enormously important endeavor as countries attempt to address energy, climate and medical concerns.

Key Publics

Targeting messages to specific groups is essential in ensuring the communications plan is effective. However, the following facts can provide some insight into where and who to target:

- Republicans are more likely than Democrats and independents to favor nuclear energy (Gallup, 2016)
- Some environmental groups such as Greenpeace (which cites radioactive waste as a factor in their opposition) and The Sierra Club oppose nuclear energy
- High school and college students have a basic understanding of science as learned in their classes and have not witnessed first hand the widespread, anti-nuclear protests of the late 20th century
- Corporations whose production of goods and services involves radiation (airlines, food production companies, energy companies) can benefit from public understanding and acceptance of radiation

Therefore, the campaign should aim to reach Democrats, environmental groups, millennial students and corporations whose production of goods and services involves radiation.

The Campaign

Overview

In order to change the narrative surrounding radiation, the next step is a campaign involving digital, social and print media along with paid and earned placements across these channels. The **#RadiationReimagined** campaign will demonstrate the positive contributions radiation makes in our society, while giving viewers an accurate perception of the risks involved. The use of the word “reimagine” prompts the public to reconsider their beliefs surrounding radiation and suggests that there is something more to learn on the matter. The U.S. Department of Energy will sponsor the creation of this campaign and reach out to third party stakeholders as potential co-sponsors who may benefit from increased public understanding of radiation to fit their policy objectives. These groups may include representatives from the nuclear energy industry and the medical technology industry.

Website and Social Media

The campaign will involve the creation of a website titled www.radiationreimagined.org. The website will host an easily-digestible FAQ page with radiation facts. It is crucial that the website

communicates in terms any adult with no scientific background would understand, yet it should link to medical journals and studies that surpass this level. This balance ensures different demographics can access and learn from the site. Different subheadings in a menu labeled "Where is radiation?" will include categories like food, nuclear power, natural elements, and medicine and will guide viewers to content that demonstrates the safety of radiation in these contexts. However, to ensure a balanced and fair understanding, a page detailing the dangers and risks of radiation will address Fukushima and Chernobyl, yet do so in a way that highlights the safety measures put in place at all commercial nuclear facilities to ensure safety.

Website Home Page:

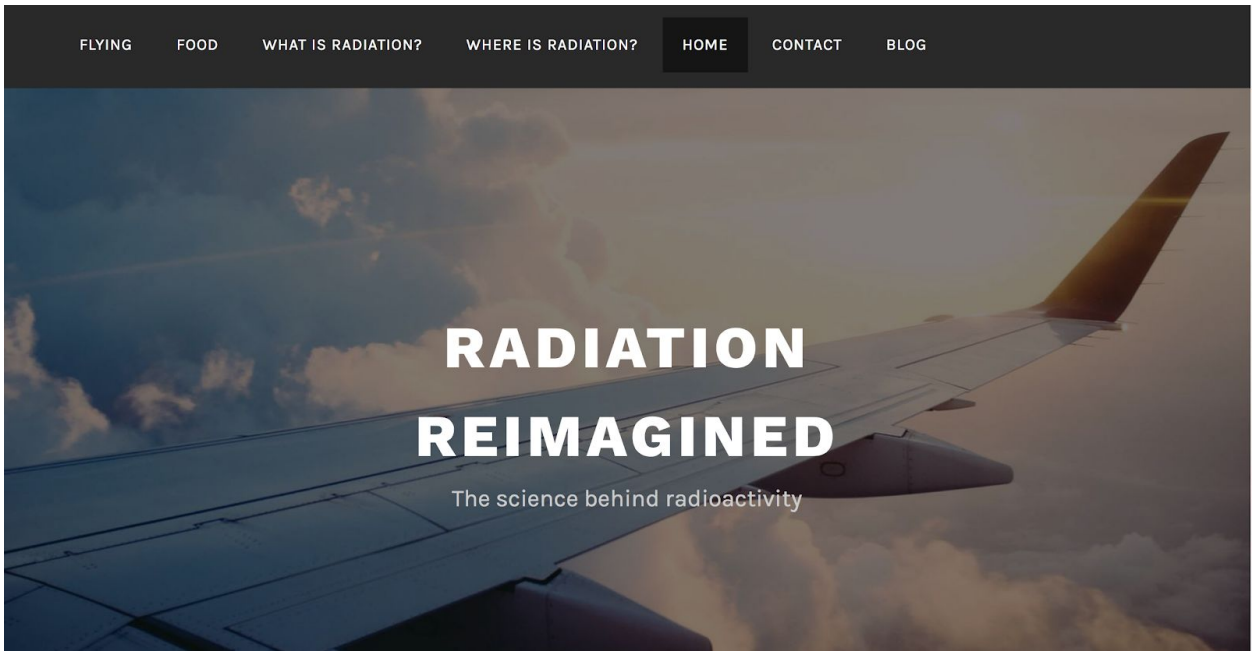

Image A: Created with Wordpress, this website can be used as an educational resource with fact sheets and videos under each individual heading.

In addition, social media accounts across Twitter and Facebook titled @RadiationReimagined will post content consistent with the messaging and talking points addressed in the print and digital ads. A communications specialist will ideally run these accounts, posting graphics, brief facts and statistics about radiation, and cross-promoting platforms by tweeting links to the website and also pulling social media feeds onto the website. The hashtag #RadiationReimagined will continue the dialogue across all social channels.

Print/Digital Advertisements

The campaign will involve multiple print and digital advertisements. These advertisements will be placed in prominent magazines that draw wide demographics, as well as science-based

magazines where readers are seeking out related information. In addition, advertisements in public transportation locations will draw a wide audience. In cities where busy professionals don't always have time to crack open a magazine, commuters can glance up and see an advertisement posted on the bus near the ceiling, for example. The following images are advertisements highlighting the campaign and the positive attributes of radiation:

Print/Digital Advertisement #1:

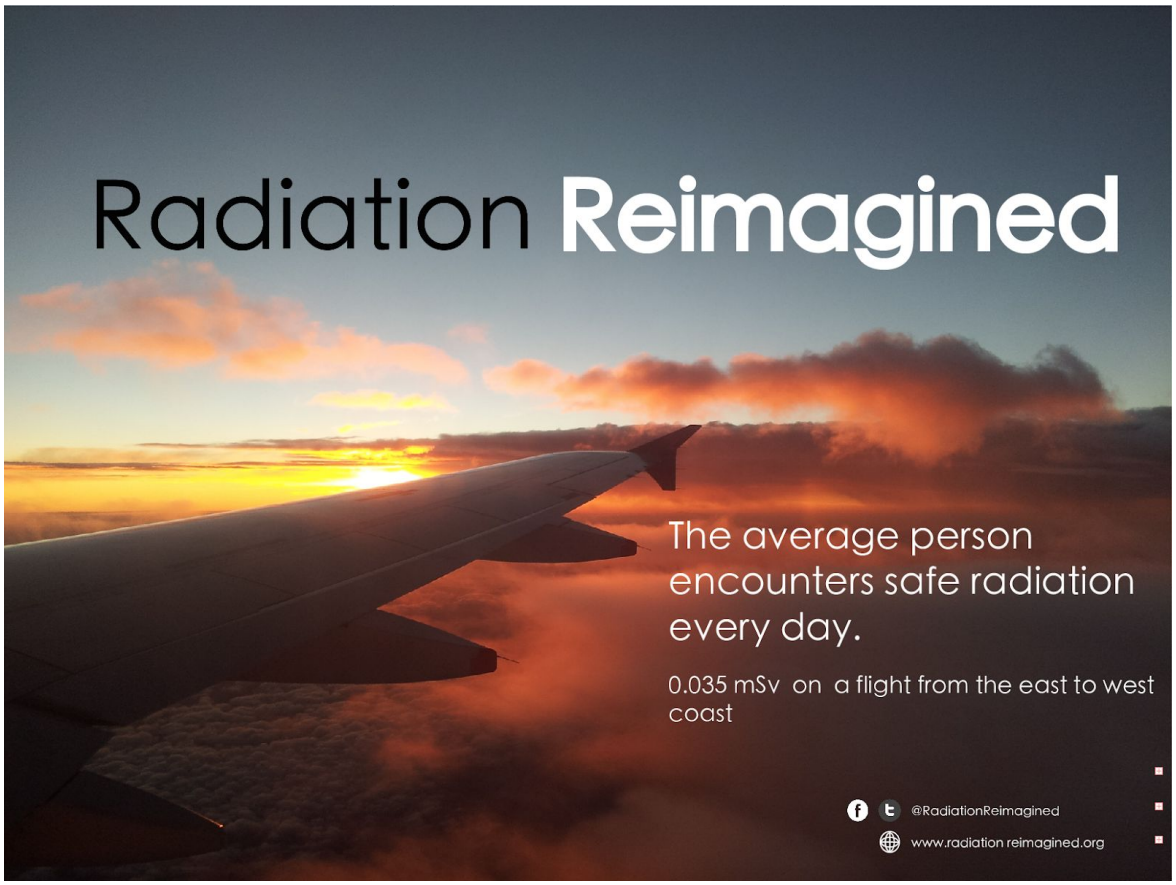

Image B: Created in Adobe Illustrator, this print and/or digital ad gives a fact about safe radiation, while relating the term to a typical experience for many Americans. It highlights the campaign name over a pleasing, calm visual.

Print/Digital Advertisement #2:

Image C: Created in Adobe Illustrator, this print and/or digital ad gives a fact about safe radiation, while relating the term to a typical experience for many Americans. It highlights the campaign name in bright, cheery colors.

Through a system of paid advertising on Facebook, Instagram and Twitter, these advertisements can appear in users' social media feeds. These images can link back to the website, where users can "swipe to learn more."

Radio/Podcast Advertisements

Through a series of paid advertising on radio networks and podcasts, the campaign will spread to impressionable listeners over the radio waves in the car during their morning commute. These advertisements will state one or two facts about radiation and encourage listeners to visit the website and social media pages to learn more. The twenty-second script will read:

"Did you know the average person encounters safe radiation every day? When we fly, eat a banana, or get an x-ray, we're exposed. Radiation at these levels is harmless and can help propel our lives forward. Visit www.radiationreimagined.org to learn more. Sponsored by the U.S. Department of Energy's Office of Science."

Radiation Reimagined Conference: 2018

A conference featuring prominent government officials, agencies and associations will add an interactive approach to the campaign. An open dialogue addressing the risks and benefits of radiation with honesty and transparency will guide the discussion towards a positive narrative. Contributions from associations or groups with policy objectives surrounding radiation will be valuable. Agencies in attendance may include representatives from the Department of Energy, the Nuclear Regulatory Commission, and the Environmental Protection Agency. Representatives from the nuclear energy and medical technology industries should speak as well. Each representative will discuss their agency or association's role in promoting safe radiation standards. A suggested keynote speaker is David Ropeik, Director of Communications for Harvard University's Center for Risk Analysis. Inviting journalists and allowing them to ask questions to the panelists will ensure coverage of the event reaches the public.

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Conference promotion material:

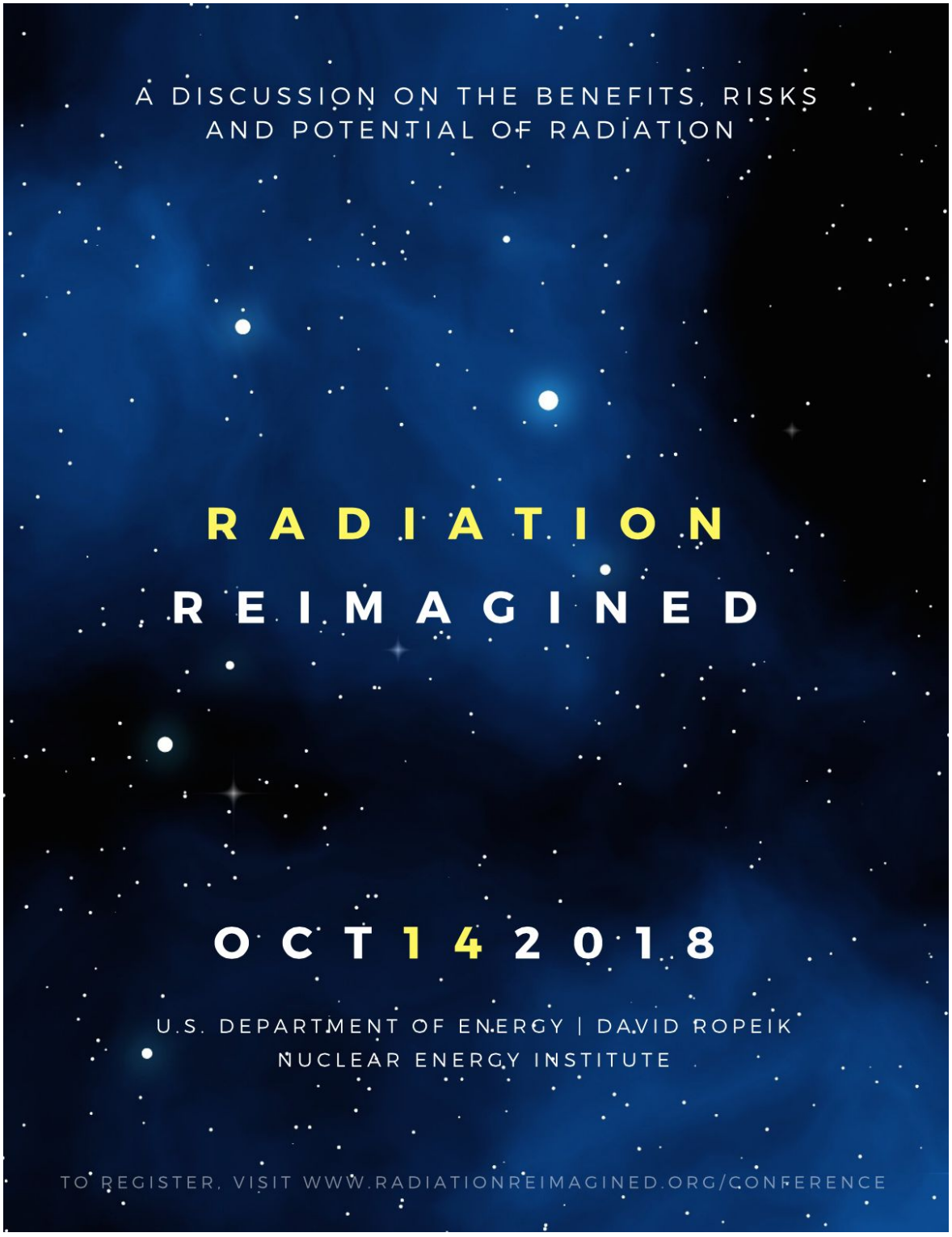

Image D: Created in Canva, this promotional flier can be distributed across social media channels and emailed to potential attendees.

Evaluation

Following the end of the campaign, those who executed it should create an analytics report on the social media progress generated. They should also create media reports to determine the coverage generated by the conference. Evaluation is a critical step in determining which strategies to use for future campaigns.

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