Additional Requirements for Research Involving the Department of Energy (DOE)

Purpose:

The information in this guidance is for investigators conducting human subjects research involving the Department of Energy (DOE), including the National Nuclear Security Administration (NNSA).[1] While the DOE is a signatory to the 2018 Revised Common Rule which took effect January 21, 2019, research conducted or supported by the DOE requires compliance with federal regulations codified at 10 CFR Part 745 and additional policy and procedures contained in DOE Directive Order 443.1C and DOE Directive 206.1.

In this document:

Applicability:

Human Subject Research involves the DOE when any of the following apply:

- The research is conducted or supported by the DOE
- The research occurs at DOE institutions (regardless of funding source)
- The research is conducted by DOE or DOE contractor personnel (regardless of funding source or location)

This includes both domestic and international environments, as well as classified and proprietary research meeting any of the above conditions. [2]

[1] Human Subject Research funded through Strategic Intelligence Partnership Program (SIPP) must be reviewed and approved by the Central DOE IRB-Classified. (DOE Order 443.1C Paragraph 4.a(7))
[2] DOE Order 443.1C Paragraph 4.a

Definitions:

DOE Directive Orders provide additional definitions related to human subjects research beyond those codified in the Common Rule at 10 CFR Part 745. Some of these definitions expand those detailed within the Common Rule, while others provide interpretation or clarification of terms that are not explicitly defined as part of the Common Rule.

Human Subject Research definition is expanded to include:

- **Human Terrain Mapping (HTM)/Human Social Culture Behavior (HSCB) studies**. Research and data gathering activities primarily conducted for military or intelligence purposes to understand the "human terrain," – the social, ethnographic, cultural, and political elements of the people among whom U.S. Armed Forces are operating and/or in countries prone to political instability. This work includes observations, questionnaires, and interviews of groups of individuals, as well as modeling and analysis of collected data. DOE policy is that HTM activities are managed as Human Subjects Research.[3] Research use of HTM data must be strictly limited to analysis and modeling of de-identified data.[4]

- **Modification of the Human Environment research studies.** Research in which people have their environment intentionally changed or manipulated for the purposes of the research, with or without their knowledge; and/or that cannot be validly conducted without people present (other than those conducting the research), regardless of whether identifiable private information is collected about them. Before such research begins, the potential risks to those individuals must be considered by the appropriate DOE IRB. DOE policy is that these projects are managed as Human Subjects Research.[5]

Additional DOE-specific definitions:[6]

Adverse Event* – Any unfavorable medical occurrence in a human subject, including any abnormal sign (e.g., abnormal physical exam or laboratory finding), symptom, or disease, temporally associated with the subject's participation in the research, whether or not considered related to the subject's participation in the research.

Significant Adverse Event – An adverse event that is unexpected and substantively impacts the human subject(s).

Serious Adverse Event – Any adverse event temporally associated with the subject's participation in the research that meets *any* of the following criteria:

- results in death;
- is life-threatening;
- requires inpatient hospitalization;
- results in persistent or significant disability/incapacity;

*NOTE: The DOE definition of an *Adverse Event* differs from Iowa State IRB's generalized definition contained in the policy *"Reporting Adverse Events and Unanticipated Problems Involving Risks to Subjects or Others"*. Investigators conducting DOE research at Iowa State University must consider both definitions when assessing a potential occurrence.

[3] DOE Order 443.1C Paragraph 8.r
[4] DOE Order 443.1C Paragraph 4.a(12)
[5] DOE Order 443.1C Paragraph 8.w
[6] DOE Order 443.1C Paragraph 8.a-z

- results in a congenital anomaly/birth defect; or
- based upon appropriate medical judgment, may jeopardize the subject's health and may require medical or surgical intervention to prevent one of the other outcomes listed in this definition.

Breach or Data Breach -- An incident involving the loss of control, compromise, unauthorized disclosure, unauthorized acquisition, or any similar occurrence where:

- A person other than an authorized user accesses or potentially accesses Personally Identifiable Information (PII); or
- An authorized user accesses or potentially accesses PII for other than the authorized purpose.

Breaches do not require evidence of harm to an individual, or of unauthorized modification, deletion, exfiltration, or access to information. Additionally, PII can be breached in any format, including physical (paper), electronic, and verbal/oral.[7]

Classified Human Subjects Research - Research involving human subjects that is classified, in whole or in part, in accordance with the Federal sponsor and/or DOE criteria.

De-identified Data - Records that have had enough personally identifiable data removed or obscured such that the remaining information does not identify an individual and there is no reasonable basis to believe that the information can be used to identify an individual.

Generalizable – Information/research findings that are intended to be applied to populations of situations beyond that studied/will have meaning and impact outside of the single immediate activity itself.

Personally Identifiable Information (PII) - any information collected or maintained about an individual, including but not limited to, education, financial transactions, medical history and criminal or employment history, and information that can be used to distinguish or trace an individual's identity, such as his/her name, Social Security number, date and place of birth, mother's maiden name, biometric data, and including any other personal information that is linked or linkable to a specific individual.

Protected Class of Human Subjects - Populations who may be more vulnerable to coercion or undue influence when participating as research subjects (e.g., children, prisoners, decisionally impaired individuals, and other vulnerable populations) are afforded additional protections by the Federal regulations and/or the IRB. **DOE and DOE site employees/contractors are considered vulnerable subjects when participating in research** and additional care must be taken to ensure their participation is truly voluntary (e.g., by ensuring they do not report to members of the research team) and that data collected about them is kept confidential.

Unanticipated Problem* - Any incident, experience, or outcome meeting all three of the following criteria:

- **Unexpected** (in terms of nature, severity, or frequency) given (a) the research procedures that are described in the protocol-related documents, such as the IRB-approved research protocol and informed consent document; and (b) the characteristics of the subject population being studied

[7] DOE Order 206.1 Paragraph 7.c

- **Related or possibly related** to participation in the research (possibly related means there is a reasonable possibility that the incident, experience, or outcome may have been caused by the procedures involved in the research)
- **Likely to place subjects or others at greater risk of harm** (including physical, psychological, economic, or social harm) than was previously known or recognized.

*Note: DOE's definition of an Unanticipated Problem aligns with that contained in Iowa State IRB's policy *"Reporting Adverse Events and Unanticipated Problems Involving Risks to Subjects or Others"*.

Reporting Requirements:[8]

Advance Notification

The DOE Human Subjects Protection (HSP) Program Manager must be notified in advance of human subjects research (even if meets the regulatory definition for exempt review) if it involves:

- a foreign country;
- potential for significant controversy (e.g., negative press/reaction from stakeholder or group);
- research subjects from a protected class (prisoners, children, individuals with impaired decision making, or DOE federal or contractor employees as human subjects) that is outside of the reviewing IRB's typical range/scope; or
- the generation or use of classified information.

Immediate Notification

- Suspected or confirmed data breaches involving Personally Identifiable Information (PII) must be immediately reported to the, DOE Project Officer, IRB, and DOE-Cyber Incident Response Capability in accordance with requirements of DOE O 206.1. Breaches may include PII in printed, verbal, or electronic form
- Serious adverse events require notification of the appropriate DOE HSP Program Manager immediately upon learning of the event.

Additionally, the HSP Program Managers and the applicable IRB(s) must be notified of any corrective actions taken and consulted regarding the plan for any remaining corrective actions.

48hr Notification

The DOE Human Subjects Protection Program Manager must notified within 48 hours of:

- unanticipated problems;
- significant adverse events;
- research complaints;
- termination or suspension of IRB approval; or
- of known or potential incidents of noncompliance.

Notification should include a description of corrective actions taken. DOE HSP Program Managers should be consulted regarding plans for any remaining corrective actions.

[8] DOE Order 443.1C Paragraph 4.d(1)-(5)

Posting

The DOE maintains an unclassified online compilation of summary information of all DOE research projects -- Human Subjects Research Database (HSRD).[9] Human Subjects Research projects involving the DOE (e.g., funded by DOE, conducted in DOE facilities) must be reported annually to HSRD in accordance with directions provided by the DOE Human Subjects Protection Program Manager. The annual reporting to HSRD requirement includes research that has been determined to be exempt and research for which continuing review by the IRB is not required.

DOE-specific Requirements:

Training

DOE imposes additional training renewal requirements for PIs and all project staff who will have access to personally identifiable information (PII) and/or have interaction or intervention with research subjects. Human subjects research training, completed at Iowa State through CITI, must be **renewed at least every 3 years**.[10]

Employees as Participants

As with all human subjects research, any time subordinates (e.g. employees, contractors, students) are involved with projects conducted by their supervisors/employers they may be vulnerable to pressures (real or perceived) to appear cooperative. The DOE acknowledges this susceptibility for coercion or undue influence and extends protections for vulnerable populations to personnel (employees, contractors, students) who may become research subjects. [11]

Additionally, researchers are discouraged from conducting research on themselves, unless clearly justified and approved by the IRB and the researchers' management. While researchers may be aware of the risks of self-experimentation, they may also be more willing to accept risks that are ill-advised.[12]

The DOE Central IRB has published a checklist for IRB review considerations when employees participate as research subjects. Investigators should address these items when proposing research to the IRB.

CHECKLIST-Protecting Employees Who Participate as Research Subjects[13]

- ☐ Subject selection is not based solely on the subject's ready availability or malleability.
- ☐ The protocol explains that this is not a sample of convenience.
- ☐ The description of the use of the employees as subjects for which use or access is included in the protocol summary and is necessary for the research.

[9] DOE Human Subject Research Database: https://science.osti.gov/ber/human-subjects/Education-and-Resources/HSRD
[10] U.S. Department of Energy "Human Subjects Protection Program: Frequently Asked Questions For Researchers"
[11] DOE Order 443.1C Paragraph 4.g
[12] U.S. Department of Energy *Human Subjects Protection Program (HSPP)| DOE-Specific Requirements* https://science.osti.gov/ber/human-subjects/Regulations-and-Requirements/DOE-Specific-Requirements
[13] E. White/C. Hautala-Bateman. 2019. *CHECKLIST-Protecting Employees Who Participate as Research Subjects HRP-423*

- ☐ Advertisements will be posted throughout the site to recruit subjects from a broad base of employees, contractors, and students. If, not justification was provided.
- ☐ The use or disclosure of the workers' population or data involves no more than a minimal risk to the worker.
- ☐ Recruitment materials include how objectivity and validity of the data will be ensured.
- ☐ Specific steps should be included about how potential coercion will be minimized.
- ☐ If the Investigator is including direct reports justification has been provided for why this is needed. (Participation of direct reports to the research team should be avoided whenever possible.)
- ☐ The research could NOT practicably be conducted without using this population.

Projects Involving Modification of the Human Environment

The DOE asks that IRBs consider key questions when reviewing and approving exempt and nonexempt research that involve changes or manipulations to an environment (e.g., testing new energy-efficient devices in homes or offices and responding to surveys about such devices and personal energy use practices; studies of airflow in public places or individuals' homes, using tracer gases).

The DOE Central IRB has published a checklist for IRB review considerations for projects involving human environment modification. Investigators should address these items when proposing modification of the human environment research to the IRB.

CHECKLIST-Modification of the Human Environment[14]

- ☐ Do individuals other than the research team need to be present for the research to occur?
- ☐ Have all the risks and discomforts been identified and considered and minimized? For example:
    - have chemicals/materials been evaluated for human health effects,
    - all devices had appropriate safety testing, and
    - other potential risks been identified in the population group(s) to be exposed?
- ☐ How will anyone who is involved in the study but not part of the research staff be informed of the research?
    - Will consent forms be used?
    - Are key elements of informed consent included or requirements for a waiver met?
- ☐ Is there a way for people to opt out if they wish without repercussions?
- ☐ How will the PI monitor the research?
- ☐ How and from what sources will data be collected?

Personally Identifiable Information (PII) (including Protected Health Information (PHI))

Human Subjects Research must comply with Federal and DOE-specific requirements for protecting personally identifiable information (PII) (including PHI).

[14] E. White/C. Hautala-Bateman. 2019. *CHECKLIST-Modification of the Human Environment HRP-421*

Specifically, the research protocol must include a description of process for:

- ☐ Keeping PII confidential;
- ☐ Using PII only for purposes of the IRB DOE-approved research;
- ☐ Making no further use or disclosure of the PII except when approved by the responsible IRB(s) and DOE, where applicable, and then only:
    - In an emergency affecting the health or safety of any individual;
    - For use in another research project under these same conditions and with DOE written authorization;
    - For disclosure to a person authorized by the DOE program office for the purpose of an audit related to the project; or
    - When required by law.
- ☐ Releasing PII only under a procedure approved by the responsible IRB(s) and DOE, where required;
- ☐ Establishing reasonable administrative, technical, and physical safeguards to prevent unauthorized use or disclosure of PII;
    - ☐ Encryption: Using FIPS 140-2 certified encryption that meet the current DOE password requirements cited in DOE Guide 205.3-1;
        - Protecting PII data stored on removable media (CD, DVD, USB Flash Drives, etc.) using approved encryption methods;
        - Encrypting data files containing PII that are being sent by email and sending the password in a separate email, telephone call, or letter.
        - Using approved encryption methods for websites submitting information that includes PII
    - ☐ Using two-factor authentication for logon access control for remote access to systems and databases that contain PII.
    - ☐ Shipping removable media or double wrapped hard copy documents via express overnight service with signature and tracking capability.
    - ☐ Handling and marking documents containing PII as "containing PII" or "containing PHI";

In addition to other reporting requirements, reporting the loss or suspected loss of PII immediately upon discovery to: 1) the DOE Project Officer; and 2) the applicable IRB(s).

IRB Review Requirements[15]

Social Media Research

Any research that uses social media data must be submitted to the IRB for human subjects research review and determination.

Single IRB Review

Human subjects research involving multiple DOE sites (e.g., members of the research team from more than one DOE site and/or data or human subjects from more than one DOE site) must be reviewed and approved by one of the Central DOE IRBs prior to initiation. If authorized by the DOE and/or NNSA HSP Program Manager, another IRB may serve as IRB of record provided a reliance agreement is in place between the organization(s) conducting the research and the organization responsible for IRB review.

[15] DOE Order 443.1C Paragraph 4.a

IRB Composition for Full-Board Review

In order for a DOE IRB or DOE Site IRB to vote on a new or amended protocol that requires full-board review, there must be a minimum of five members present, including a scientist, a nonscientist, and an unaffiliated member.

Determination of Exemption

All determinations of exemption must be made by the IRB or IRB office. This requirement aligns with Iowa State University IRB's Standard Operating Procedures for all human subjects research, regardless of funding.

Special Requirements for DOE Classified Research:[16]

Proposed classified research must be reviewed by an IRB committee meeting specific composition requirements. Researchers considering DOE research involving classified information should contact the IRB office for guidance.

Researchers should note that the exempt and expedited review processes are prohibited for classified research. The fact that research meets a particular exemption category or is eligible for expedited review may be noted, but a full IRB review is required.

Research records related to IRB review/approval of classified and key research must be maintained permanently (not less than 100 years). Signed copies of consent forms must be stored in a separate, but secure central location, other than the researchers' office and participants of such research must be notified during the consent process of how to access a copy of their individual signed classified consent forms should they want to in the future.[17]

Additional informed consent requirements for classified research:

- The identity of the sponsoring Federal agency must be disclosed. If disclosure could compromise intelligence sources or methods the IRB may waive this requirement. However, the study must be no more than minimal risk and the IRB must determine that not disclosing the funding would have no adverse effect on subjects.

- The consent document will state that the project is classified, what that means for the purposes of the project, and to what part of the research the classification applies. The IRB must determine whether the potential participants need access to classified information to make a valid informed consent decision.

[16] DOE Order 443.1C Paragraph 4.a(14)
[17] DOE Order 443.1C Paragraph 4.f

Additional Information:

10 CR 745 *Protection of Human Subjects U.S. Department of Energy*

DOE Directive Order 206.1 *Department of Energy Privacy Program*

DOE Directive Order 443.1C *Protection of Human Research Participants*

U.S. Department of Energy *Human Subjects Protection Program*: https://science.osti.gov/ber/human-subjects

CHECKLIST-Protecting Employees Who Participate as Research Subjects HRP-423

CHECKLIST-Modification of the Human Environment HRP-421

DOE-Cyber Incident Response Capability website information for response management

Reporting Adverse Events and Unanticipated Problems Involving Risks to Subjects or Others

Iowa State University | IRB | Policies and Guidance

Document History

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