

problems which can complicate works on the CWD. One of them concerns the problems connected to neutralization of reactionary masses of the CWD. In the Russian Federation it is not constructed yet any enterprise for destruction with a full cycle.

The question of neutralization of reactionary masses yet does not find the full decision. In this connection there is a threat of that the problem of reactionary masses can appear outside of works on destruction is direct of CW and beyond the framework of 2012.

The technical analysis of possible technologies and directions of neutralization of reactionary masses of destruction of lewisite and POS in the Russian technologies of the CWD is carried out.

36. SOME TECHNICAL QUESTIONS OF DESTRUCTION OF CHEMICAL ARTILLERY ARMS FOR OBJECT IN KIZNER (UDMURTIA) (14)

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On object in settlement Kizner (Udmurtia) contains more than 2 million of artillery shells with POS. The beginning of construction of object according to new variant of the Program of the CWD in the Russian Federation, accepted at the end of 2005, is supposed in 2007. The ending of works will be in 2012. The general approaches to neutralization of chemical artillery arms in the Russian technologies of the CWD are considered.

The analysis of some problem technological moments is carried out. It is marked, that the technology includes 3 stages of processing of shells, that demands the control of safety of realization of operations at all stages, and also the control of quantity of process able arms. Prospective technology of neutralization of reactionary masses for object in Kizner causes the certain doubts since results in formation of a plenty of oxides of nitrogen.

From the carried out analysis it is possible to make a conclusion, that some technical questions of destruction of chemical artillery arms can result to that works on the CWD in the Russian Federation can be not completed in 2012.

37. WMD NONPROLIFERATION: BIOSECURITY IN THE AGE OF TERRORISM (8)

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The international community has cooperated in arenas where diplomacy, treaties and conventions, and international bodies such as the IAEA and UN Security Council can have successful roles controlling WMD proliferation. This especially is the case for nuclear and chemical weapons. In our view, the potential use of biological agents and toxins presents a distinctive challenge not necessarily amenable to standard solutions and legal controls.

Commercial biotechnology, basic biological research, and public and animal health are intertwined and of global significance. Advancements in these civilian activities have legitimate value, but also can serve the needs of state-sponsored defensive and offensive biological weapons programs.

More important, technical and scientific advances and development of public bioinformatics databases also simplifies an otherwise complex world for trans-national terrorists. In our paper we will draw upon our personal international experiences, including in the former Soviet Union and Iraq, to explain our concept of 'shared risk' within the scientific community. Personal engagement, meaningful collaboration, adherence to uniform ethics and standards, and common scientific goals on an international scale are the best hedge against bio-terrorism.

The global scientific community already is based upon shared principles that cross both cultural and political boundaries and thus are pre-adapted to play a major role in preventing the use of biology as a terrorist weapon.

Key words: Iraq, former Soviet Union, WMD proliferation, bio-terrorism

38. BIOHAZARD ANALYSIS OF SELECT BIODEFENSE VACCINE CANDIDATES-VENEZUELAN EQUINE ENCEPHALITIS VIRUS STRAIN 3526 AND *Francisella Tularensis* LVS (6)

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Biohazard assessment of biodefense vaccine candidates forms the basis for a facility- and activity-specific risk assessment performed to determine the biosafety levels and general safety standards required for biological product development.

As part of our support to the US biodefense vaccine development program, we perform a systematic biohazard assessment of potential vaccine candidates with the primary objective to, (a) Identify and characterize hazard elements associated with the wild type and vaccine strains, (b) Provide biohazard information on the etiologic agent (vaccine candidate) to assess Phase 1 clinical trial facility sites, (c) Provide a baseline to conduct an agent and facility-specific risk assessment at clinical trial facilities interested in

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performing phase 1 clinical trial, (d) Provide comparative hazard profiles of the vaccine candidates with MSDS for wild-type to identify and establish appropriate protective biosafety levels, and (e) Support determination of a hazard level to select personal protective equipments as required under the OSHA guidelines.

This paper will describe the biohazard analysis of two vaccine candidates, Venezuelan Equine Encephalitis Virus Strain 3526 and Francisella tularensis LVS, a viral and bacterial agent, respectively. As part of the biohazard assessment we performed a thorough review of published literature on medical pathology, epidemiology, pre-clinical investigational studies, and environmental data on the etiologic agent subtypes and the vaccine candidates.

Using standard analytical procedures, the data were then analyzed relative to two intrinsic hazard parameters-health hazard and environmental hazard. Using a weight-of-evidence (WOE) approach, the potential hazards of etiologic agent wild subtypes and vaccine candidates were ranked under three main categories: Public Health Hazard, Environmental Hazard, and Overall Hazard.

A WOE scoring system allows for both a determination of the intrinsic hazard of each vaccine, and also allows for a comparison of values between vaccines. The information in this hazard assessment, and the WOE scores in particular, provided a systematic analytical framework to begin facility-specific risk assessments for follow on manufacturing and Phase 1 clinical trial.

39. EXPORT CONTROLS AND INDUSTRY OUTREACH MUTUAL BENEFITS OF BUSINESS – GOVERNMENT PARTNERSHIPS (OPCW)

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This presentation is intended to offer a broader understanding of the strategy and merits for developing a mutually contributory relationship between government and industry and how the process provides a positive foundation to support and strengthen an effective nonproliferation export control regime. The study will provide background into the basis for development of multilateral regimes for export controls along with an overview covering the historical involvement of industry and their responsibility in dual-use research and development.

The paper will then offer an examination of the unique composition and status of the dual-use industry which makes them vulnerable to the illicit diversion of their products and identify and discuss the recognized indicators of that process.

The focus will then move toward providing justification for establishing a close working

relationship or partnership between industry and government and how the process of that partnership can deter access and opportunity for the illicit diversion of dual-use goods.

Finally, in summation the presentation will highlight the mutual benefits that result from that relationship.

40. USE OF THE IMMUNOGENETICAL METHODS FOR BIOLOGICAL RISKS EVALUATION (14)

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For the present biological risk evaluation and forecast, information on gene-phenotypic characteristics of circulating regional EDAs, their connatural sources and conditions for epidemic distribution is necessary. We lead a relative gene-phenotypic comparison of vaccine and wild F.tularensis strains isolated from carriers, vectors, environment and patients in the different natural foci.

Phenotyping investigations were done on "in vitro" model with use of the human peripheral blood immune competent cells (ICC) of non-vaccinated and vaccinated with LVS volunteers. Variations of virulence manifestations of F.tularensis strains, isolated from different sources (ticks, waters, patients) are revealed. Principal differences in interactions of ICC with strains of various virulence degree, presence of ICC structural-functional changes in cytokines secretion dynamics at the presence of the wild and vaccine strains are shown.

Morphological proofs for toxic materials production by pathogen during reproductive development term, damaging membranes structure, nucleus and cytoplasm are received. Certain interrelations between isolates phenotypic characteristics, source of isolation and types of natural foci is revealed. VNTR-analysis has showed genotypical heterogeneity and specific peculiarities in VNTR locuses combination of F. tularensis strains from different sources.

Biological sence of VNTR-locuses combinations variations and their influence upon virulence signs expression are discussed. The complex approach, including agent's gene-phenotypic characteristics, ecological and geographical features of the natural foci, level of the human recruitment into the epidemic process will promote development of measures for counteraction in case of agents and their modified variants deliberate use.

Key words: biological risks, methods, tactics



HR0700054



HR0700055