

Numerical Impacts from the TEEL Development Methodology Changes

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Introduction

- NA-41 commissioned the Independent Review Committee to perform an external review
- Most updates are a result of Committee recommendations
- Revision 27 of the PAC dataset is the first revision with extensive updates to methodology

Biggest Changes to Date!

- Website
- Methodology
- Hierarchies
 - Exposure Limits
 - Toxicity Data Sources
- Data Extraction
 - Species
 - Routes
 - IDLH Values
- Data Calculations
 - Time Scaling
 - Adjustment factors, etc.
- Toxicity Data
- Value Changes

Website

Chemical Safety Program: PACs for Chemicals of Concern - Windows Internet Explorer

http://www.atlintl.com/DOE/teels/teel.html

Google

Chemical Safety Program: PACs for Chemicals of Conc... CSS Examples

Page Safety Tools



Protective Action Criteria (PAC): Chemicals with AEGLs, ERPGs, & TEELs

Rev. 27, February 2012

This site allows users to access the U.S. Department of Energy's (DOE's) current data set of Protective Action Criteria (PAC) values in a variety of ways: as a searchable database, as an Excel file, and as a series of tables in PDF format. It also provides archived versions of the PACs for reference.

PAC values in the searchable database and tables correspond to Revision 27, published February 2012. This database provides information for 3,387 chemicals.

Emergency exposure limits are essential components of planning for the uncontrolled release of hazardous chemicals. These limits, combined with estimates of exposure, provide the information necessary to identify and evaluate accidents for the purpose of taking appropriate protective actions. During an emergency response to an uncontrolled release, these limits may be used to evaluate the severity of the event, to identify potential outcomes, and to decide what protective actions should be taken. In anticipation of an uncontrolled release, these limits may also be used to estimate the consequences of an uncontrolled release and to plan emergency responses.

DOE O 151.1C, *Comprehensive Emergency Management System*, and its supporting Guides require the use of Acute Exposure Guideline Levels (AEGLs) and Emergency Response Planning Guidelines (ERPGs) as the emergency exposure limits of choice, in order of preference. Because AEGLs and ERPGs exist only for a limited number of chemicals, DOE also commissions the development of Temporary Emergency Exposure Limits (TEELs) so that DOE facilities may conduct Emergency Planning Hazard Assessments (EPHAs) and consequence assessments during response for chemicals lacking AEGLs or ERPGs. TEELs are temporary limits for chemicals until AEGLs or ERPGs are developed. Together, AEGLs, ERPGs, and TEELs are referred to as chemical Protective Action Criteria - PACs.

TEEL values are always subject to change, being replaced by AEGLs or ERPGs when new

LINKS

- [PAC Definitions](#)
- [Search the PAC Database for AEGLs, ERPGs, and TEELs](#)
- [PAC Data in Tabular Form \(Excel and PDF files\)](#)
- [PAC Data Archives \(Excel & PDF Files\)](#)
- [Acronyms and Abbreviations for the PAC Dataset](#)
- [\[NEW\] Candidate Chemicals for Removal from the PAC Dataset \(Excel file\)](#)

Proposed Removal of Selected Chemicals from the Next Revision of the PAC Dataset

A review by the DOE Office of Emergency Management (NA-41) has identified 114 chemicals currently in the PAC dataset that may not pose hazards that would meet the definition of an Operational Emergency in DOE O 151.1C, *Comprehensive Emergency Management System*. The list of these chemicals can be found by clicking

Methodology

- No longer publish TEEL-0
- Rounding Rules:
 - ≥ 5 , round up
 - < 5 , round down
 - Round to two significant digits (AEGLE and ERP Committee)
- Eliminated the upper limit max of 500 mg/m^3 for chemicals that are solids or particulates
 - Impacts:
 - ~900 PAC-3 values
 - ~70 PAC-2 values

New Hierarchies

Exposure Limits

- TLV
- WEEL
- PEL
- REL
- MAK
- Other

Toxicity Data Sources

- HSDB
- SAX
- RTECS
- MSDSs
- Other sources

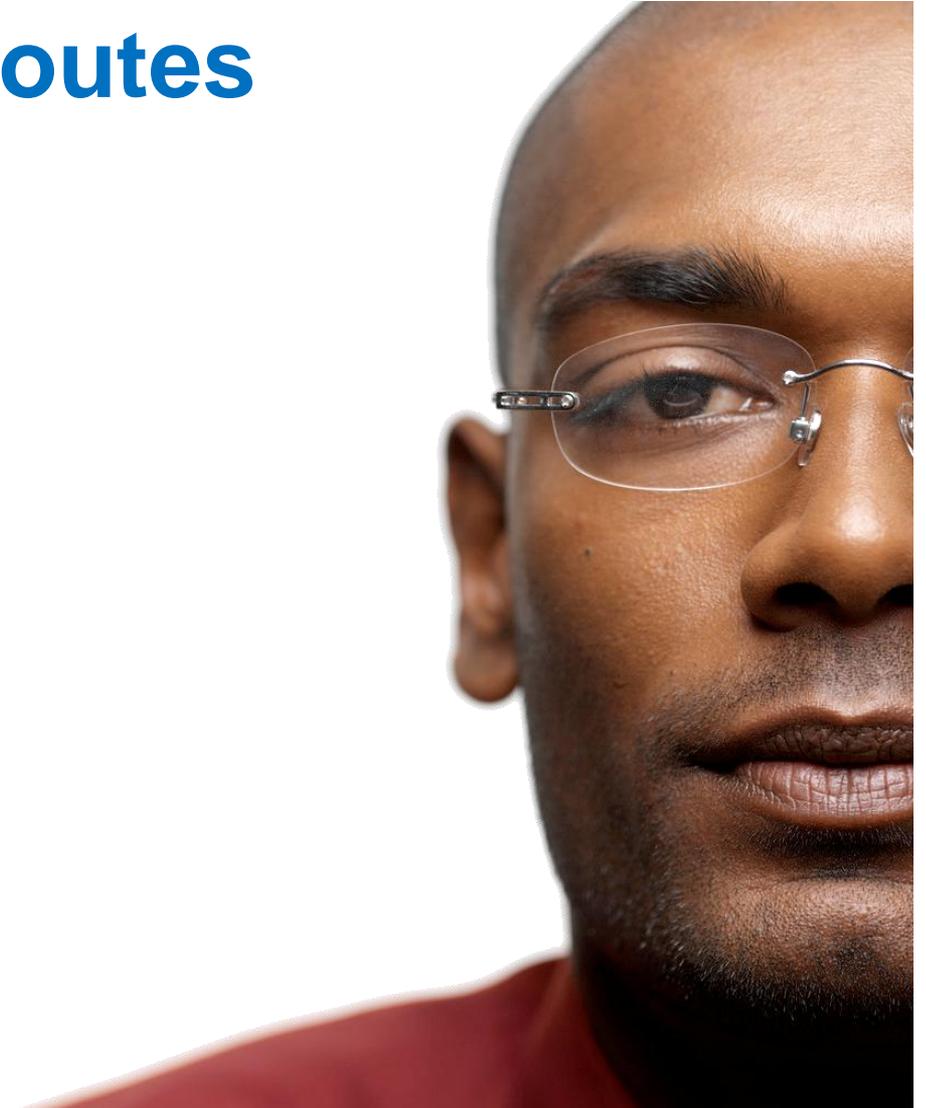
Data Extraction: Species

- Human
- Monkey
- Dog
- Rat
- Mouse
- Rabbit
- Guinea pig
- Cat
- Pig



Data Extraction: Routes

- Inhalation
- Oral
- Dermal
- Intraperitoneal
- Intravenous



Data Extraction: 1990 IDLH Values

NIOSH Publications & Products

Immediately Dangerous To Life or Health (IDLH)

Introduction

Chemical Listing and Documentation

Abbreviations for IDLH Documentation

Abbreviations for Chemical Titles

NIOSH Homepage

NIOSH A-Z

Workplace Safety & Health Topics

Publications and Products

Programs

[NIOSH](#) > [NIOSH Publications & Products](#) > [Immediately Dangerous To Life or Health \(IDLH\)](#)

May 1994

Documentation for Immediately Dangerous To Life or Health Concentrations (IDLHs)

Chemical Listing and Documentation of Revised IDLH Values (as of 3/1/95)

Substance	Original IDLH Value	Revised IDLH Value
Acetaldehyde	10,000 ppm	2,000 ppm
Acetic acid	1,000 ppm	50 ppm
Acetic anhydride	1,000 ppm	200 ppm
Acetone	20,000 ppm	2,500 ppm [LEL]
Acetonitrile	4,000 ppm	500 ppm
Acetylene tetrabromide	10 ppm	8 ppm
Acrolein	5 ppm	2 ppm
Acrylamide	Unknown	60 mg/m ³
Acrylonitrile	500 ppm	85 ppm
Aldrin	100 mg/m ³	25 mg/m ³
Allyl alcohol	150 ppm	20 ppm
Allyl chloride	300 ppm	250 ppm
Allyl glycidyl ether	270 ppm	50 ppm

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 800-CDC-INFO (800-232-4636)
TTY: (888) 232-6348

New Hours of Operation
8am-8pm ET/Monday-Friday
Closed Holidays

 cdcinfo@cdc.gov

Data Calculations: Time Scaling

- ten Berge Equation

$$C^n \times t = k$$

- Where:

C = exposure concentration

n = 1 or 3

t = exposure time

k = chemical specific constant



Data Calculations:

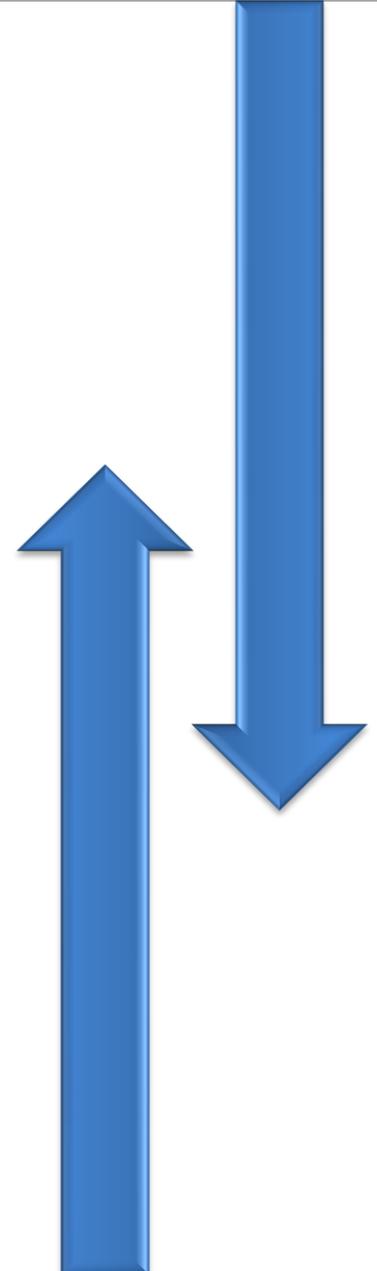
- Route Adjustment Factor (RAF)
- Adjustment factors
- We no longer calculate a human equivalent concentration
- Multiplying factors are used when there are no data

Toxicity Data Updates

- Continuing annual review (oldest chemicals first)
- Review of Beta version of Rev. 27: chemicals with PAC-3:PAC-2 ratio > 400
- Review of chemicals with routes and species no longer used (continuing effort for Rev. 28)
- Doug, Jayne-Anne, and Po-Yung performed the updates

Changed Values

- PAC-3 - 2815
- PAC-2 - 2640
 - 948↑
 - 1692↓
- PAC-1 - 2418



Ongoing/Future Updates

- Handbook Version 2.1
- Candidate Chemicals for Removal

Handbook Version 2.1

- A revision to DOE-HDBK-1046 is in development
- NA-41 has tasked ATL with completing a draft ready for RevCom by Rev. 28
- Draft will document all changes to the TEEL development process

Candidate Chemicals for Removal

- May not constitute an Operational Emergency per DOE O 151.1C
- Potential candidates include materials that are:
 - food products or food additives recognized by the FDA
 - known pharmaceuticals or components of pharmaceuticals approved by the FDA for human consumption
 - laboratory reagents and/or may exist in only small quantities
 - not likely to reach toxic concentrations in air

Candidate Chemicals for Removal

Rev. 27, February 2012

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QUESTIONS?

