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MELCOR Accident Consequence Code System (MACCS Version 1.4)

VOLUME I

User's Guide

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endtime of the action period or the endtime of the projection period. Protective actions such as decontamination and/or interdiction may be employed during the long-term period in order to ensure that the long-term dose criterion is not exceeded.

Example Usage:
CHTMPACT001 9.4608E8 (30 YEARS)

Variable Name - DSCRTI
Variable Type - Real, Scalar
Allowed Range - 0. <= value <= 1.E+5 (sieverts)
Purpose - Defines the intermediate phase dose criterion. This is the maximum allowable direct (groundshine and resuspension) dose to the critical long-term organ during the intermediate period, TMIPND. If this organ dose threshold would be exceeded in a grid element, the people living in this grid element would be relocated for the entire intermediate period. The critical long-term organ is defined below in this data block.

Example Usage:
CHDSCRTI001 .05 (PROTECTIVE ACTION GUIDE, 5 REM)

Variable Name - DSCRLT
Variable Type - Real, Scalar
Allowed Range - 1.E-35 <= value <= 1.E+5 (sieverts)
Purpose - Defines the long-term phase dose criterion. This is the maximum allowable direct (groundshine and resuspension) dose to the critical long-term organ during the long-term phase action period, TMPACT. If this organ dose criterion is exceeded during the long-term action period in a grid element, actions such as decontamination and/or interdiction would be employed to reduce or limit the critical organ dose so that the allowable dose level is not exceeded in the grid element. The critical long-term organ is defined below in this data block.

Example Usage:
CHDSCRLT001 .25

Variable Name - CRTOCR
Variable Type - Character, Scalar
Allowed Range - 3 <= LENGTH <= 8
Purpose - Defines the critical organ for the long-term period. If the direct dose to this organ in a grid element would exceed the critical organ dose for either the intermediate period, TMIPND, or long-term action period, TMPACT, protective actions would be taken in the grid element in order to limit the organ dose to these acceptable levels. This organ must have been defined in EARLY as one of the organs used for calculating cancer risk.

Example Usage:
CHCRTOCR001 'LUNGS'

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Section 3.04 Decontamination Plan Data

The decontamination plan data block defines the decontamination actions which may be taken during the long-term period in order to reduce doses to acceptable levels. This data defines the decontamination strategies which are possible, their effectiveness and cost. Each decontamination level represents an alternative decontamination strategy that would reduce the projected long-term groundshine and resuspension doses by a factor called the dose reduction factor. The decontamination goal is to reduce these doses below the long-term dose criterion using the minimal decontamination effort that would be successful. When none of the defined levels of decontamination can achieve this goal in a cost-effective manner, interdiction is required. Decontamination levels are defined starting with the smallest effort and continuing to the most intense effort. Not more than three decontamination levels can be defined.

Decontamination cost is divided into two categories and these two types of cost are calculated separately. The cost of farmland decontamination in a grid element is a function of the area of that element devoted to agriculture (see FRCFRM, defined in section 3.09). Non-farmland decontamination cost is a function of the population residing in the grid element. The strategy of decontamination within a grid element is independent of the type of area being decontaminated. For a given decontamination level, the decontamination time and decontamination effectiveness apply to both farmland and non-farmland, but costs are unique and are maintained independently for each type of decontamination..

Decontamination of a grid element serves to reduce the direct doses of individuals living there by the dose reduction factor which is defined for the decontamination effort. For the duration of the decontamination period, the population is assumed to be relocated to an area free of radioactivity. While engaged in the cleanup effort, decontamination workers accumulate groundshine doses and this is included in the calculation of health effects. No credit is taken for decontamination when condidering the magnitude of the indirect doses from the ingestion of foodstuffs or water from contaminated areas.

Variable Name - LVLDEC
Variable Type - Integer, Scalar
Allowed Range - 1 <= value <= 3
Purpose - Defines the number of decontamination levels which can be utilized.
Example Usage:
CHLVLDEC001 3

Variable Name - TIMDEC

Variable Type - Real, Array
Allowed Range - 1.E-35 <= value <= 1.E+9 (sec)
Purpose - Defines the time required for completion of each of the decontamination levels. The user must define a decontamination time for each of the LVLDEC decontamination levels. These times are measured from the end of the intermediate phase (TMIPND). The values must be monotonically increasing.
Example Usage:
CHTIMDEC001 5.184E6 7.776E6 10.368E6 (60, 90, 120 DAYS)

Variable Name - DSRFCT
Variable Type - Real, Array
Allowed Range - 0. <= value <= 100. (unitless)
Purpose - Defines the effectiveness of the various decontamination levels in reducing dose. A dose reduction factor of three means that dose is reduced to one-third of what it would be without decontamination. The values must be monotonically increasing.
Example Usage:
CHDSRFCT001 3. 15. 20.

Variable Name - CDFRM
Variable Type - Real, Array
Allowed Range - 0. <= value <= 1.E+5 (dollars/hectare)
Purpose - Defines the cost of decontaminating farmland. A farmland decontamination cost must be defined for each of the LVLDEC decontamination levels. The values must be monotonically increasing.
Example Usage:
CHCDFRM0001 395.38 1087.28 1186.13

Variable Name - CDNFRM
Variable Type - Real, Array
Allowed Range - 0. <= value <= 1.E+35 (dollars/person)
Purpose - Defines the cost of decontaminating non-farmland. This cost depends solely on population. A non-farmland decontamination cost must be defined for each of the LVLDEC decontamination levels. The values must be monotonically increasing.
Example Usage:
CHCDNFRM001 2600. 6900. 7400.

Note to user: the remaining parameters in this section are used for the single purpose of calculating the dose received by decontamination workers.

Variable Name - FRFDL
Variable Type - Real, Array
Allowed Range - 0. <= value <= 1. (unitless)
Purpose - Defines the fraction of the cost of farmland decontamination that is due to labor. A value must be supplied for each of the LVLDEC decontamination

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                levels.
Example Usage:
CHFRFDL0001     .3   .35   .35

Variable Name - FRNFDL
Variable Type - Real, Array
Allowed Range - 0. <= value <= 1. (unitless)
Purpose       - Defines the fraction of the cost of non-farmland
                decontamination that is due to labor.  A value must
                be supplied for each of the LVLDEC decontamination
                levels.
Example Usage:
CHFRNFDL001     .7   .5   .5

Variable Name - TFWKF
Variable Type - Real, Array
Allowed Range - 0. <= value <= 1. (unitless)
Purpose       - Defines the fraction of a decontamination worker's
                8 hour workday spent on farmland decontamination
                work.  A value must be supplied for each of the
                LVLDEC decontamination levels.
Example Usage:
CHTFWKF0001     .10   .25   .33

Variable Name - TFWKNF
Variable Type - Real, Array
Allowed Range - 0. <= value <= 1. (unitless)
Purpose       - Defines the fraction of a decontamination
                worker's 8 hour workday spent on non-farmland
                decontamination work.  A value must be supplied
                for each of the LVLDEC decontamination levels.
Example Usage:
CHTFWKNF001     .33   .33   .33

Variable Name - DLBCST
Variable Type - Real, Scalar
Allowed Range - 0. <= value <= 1.E+6 (dollars/man-year)
Purpose       - Defines the labor cost of a decontamination worker.
Example Usage:
CHDLBCST001    3.E4
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Section 3.05 Interdiction Plan Cost Data

The interdiction plan cost data block defines the parameters needed for the calculation of the cost of interdiction. The data supplied here are combined with data in the Site Data File and the Site Environs Description Data in the course of the calculations.

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Variable Name - DPRATE
Variable Type - Real, Scalar
Allowed Range - 0. <= value <= 1. (per year)
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