PicoRV32 Modifications in the picorv32.v file:

At line 92 error signal as input is given.

At lines 585 and 591 error=0 condition is also applied so that mem\_rdata which depends on mem\_valid signal does not get change

From lines 1201 to 1208, hamming encoder module is called for all the states of the main state machine so that the respective encoded states can be generated.

At line 1271, an error condition is applied to the addition and subtraction operations in ALU.

From line 1289 to 1299 Residue modules are called for error detection, also at line 1297 a check condition for overflow is given and at line 1299 a check signal is generated, based upon the residue algorithm for subtraction and addition operation, and it is high for all other operations, if check is low that means error has occurred.

Now if the check is low, that implies an error is detected and so PC is rollbacked, for this from line 1615 to line 1618 Program Counter’s next value is modified based on the check signal.

Also if the check is low, the Execution state has to hold so that the incorrect result is not passed on for this the modifications are done from line 1888 to 1895.

At line 1784 error condition is applied here to generate some invalid state

From line 1987 to 2009, In the default section of case statement (begins from 1539) , hamming decoder algorithm is written to generate the valid state from the invalid one (error correction).