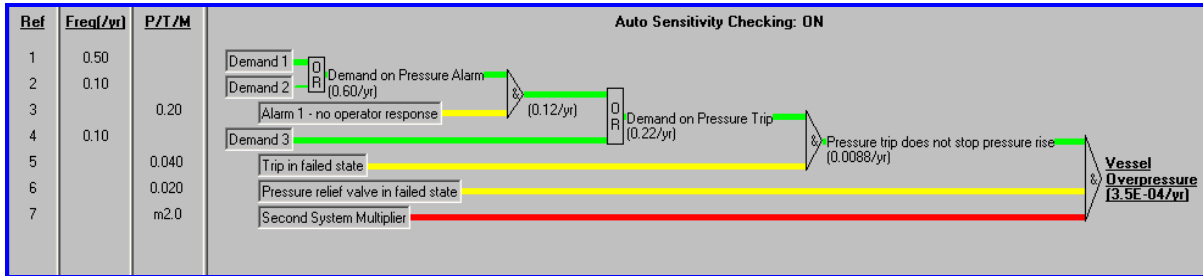


This short guide will show you how to begin to draw Fault Trees using Logidraw.

The diagram below describes the demands and protection failures that, when they occur, lead to a specific overpressure event.

Within seconds from now you will have learned how to draw this Fault Tree:



Okay start LogiDraw.

1. Click on **Start | Programs | PEL | Logidraw**. After the splash screen disappears, click **Create A Fault Tree** and when the Fault Tree Project window appears enter the title as **60 Second Guide** and click **OK**.

*The first thing to do is to display the logic and Project Toolbar*

2. Click the **View** menu and check **Project Toolbar**.

*We are now ready to create the first two demand Inputs.*

3. Click **Add Input** on the toolbar to open the "Inputs in Logidraw Fault Tree" window. Enter **Demand 1** in the Comment box, select the type **Frequency** using the radio buttons, and enter **0.5** in the Value field which corresponds to a demand rate of once in 2 years. Click **Add** to enter this data.

*When we clicked Add, Logidraw cleared the data ready for the next Input. So let's add the second demand input.*

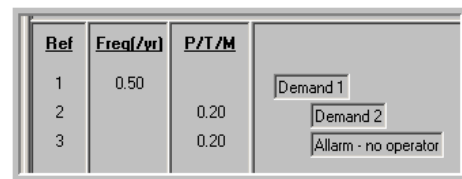
4. Enter **Demand 2** in the Comment box, select the type **Frequency** using the radio buttons, and enter **0.1** in the Value field which corresponds to a demand rate of once in 10 years. Click **Add** to enter this data.

*The risk from these two sources of demand is reduced by an alarm but what happens if the operator fails to respond?*

5. Enter **Alarm 1 – no operator response** in the Comment box, leave the selected type as **Probability**, and enter **0.2** in the Value field which corresponds to a failure probability of 1 in 5. Click **Add** to enter this data and then click **Close** to close the window.

*We now have three inputs on the screen like this:*

*We now need to draw some gates.*



6. Select **Demand 1** by clicking on it, hold down the **Ctrl** key, and select **Demand 2** by clicking on that too. Release the **Ctrl** key and click **Connect as Gate** on the toolbar. When the Gate No 1 window opens, click **OK**.

*We now have the two demands connected into an OR Gate. Let's add another gate to link in the third input.*

7. Click the **OR** Gate and then the input **Alarm 1 – no operator response**. Again click **Connect as Gate**. When the Gate No 2 window opens, click **OK**.

*This will create another gate, an AND Gate this time. Now we need to create another demand, Demand 3, a trip input, and a Pressure Relief Valve input.*

8. Click **Add Input** to open the "Inputs in LogiDraw Fault Tree" window. Enter **Demand 3** in the Comment box, select the type **Frequency** using the radio buttons, and enter **0.1** in the Value field which corresponds to a demand rate of once in 10 years; click **Add** to enter this data.

Next, enter **Trip in failed state** in the Comment box, leave the selected type as **Probability**, and enter **0.04** in the Value field which corresponds to a failure probability of 1 in 25; click **Add** to enter this data.

Finally, enter **Pressure Relief Valve in failed state** in the Comment box, leave the selected type as **Probability**, and enter **0.02** in the Value field to correspond to a failure probability of 1 in 50; click **Add** to enter this data and then **Close** to close the window.

*We need to add three more gates.*

9. Click the **AND** Gate, then the input **Demand 3** and then **Connect as Gate** on the toolbar. When the Gate No 3 window appears, click **OK**. This creates a second OR Gate.  
Now, click this second **OR** Gate, then the input **Trip in failed state**, and then **Connect as Gate**. When the Gate No 4 window appears, click **OK**. This creates a second AND Gate.  
Finally, repeat the process for the second **AND** Gate and the input **Pressure Relief Valve in failed state** to create a third AND Gate.

*There is a second identical system adjacent to the first that can also fail and cause the same overpressure event. We can provide for this simply by adding another input as a multiplier to the final AND gate.*

10. Click **Add Input** to open the "Inputs in Logidraw Fault Tree" window. Enter **Second System Multiplier** in the Comment box, select the type **Multiplier** using the radio buttons, and enter **2** in the Value field. Click **Add** to enter this data and then **Close** to close the window. Now click on this new input and drag the arrow icon to the final **AND** gate and drop the icon to connect the input to the gate.

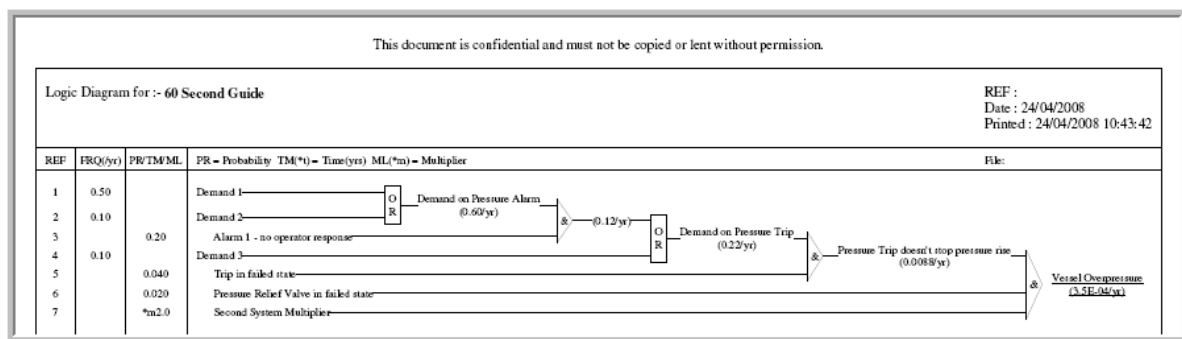
*We need to add some gate output descriptions.*

11. Double-click the first **OR** Gate; in the "Detailed Comment" box enter **Demand on Pressure Alarm** and click **OK**. Repeat the above to add the descriptions detailed on the above diagram for the second **OR** gate and the **last two AND** gates to complete the fault tree.

*To complete the exercise, let's customise the display to look like the drawing at the beginning of the guide.*

12. Select **Customise** from the **File** menu. When the Customise Options window appears, select the **Display** tab and then:
  - a. Remove the check mark from **Display 'Short' Gate Comment on Screen**;
  - b. Change **Max. No. of Characters to Display For Inputs** to **40**;
  - c. In the Default Drawing Orientation panel, check **Right to Left**.

12. Finally select **File | Print** to print the diagram the same which should look like the one below.



This program is developed, maintained and supported by PEL Support Services, ABB. We run a Hotline telephone and email service to answer any queries about the PEL products. You can contact us:

E-mail: [pel.support@gb.abb.com](mailto:pel.support@gb.abb.com)  
 Telephone: +44 (0)1925 74 1126  
 Fax: +44 (0)1925 74 1265  
 Website: [www.pelsoftware.com](http://www.pelsoftware.com)

Post: PEL Support Services  
 ABB Ltd  
 Daresbury Park, Daresbury  
 Warrington, Cheshire, WA4 4BT