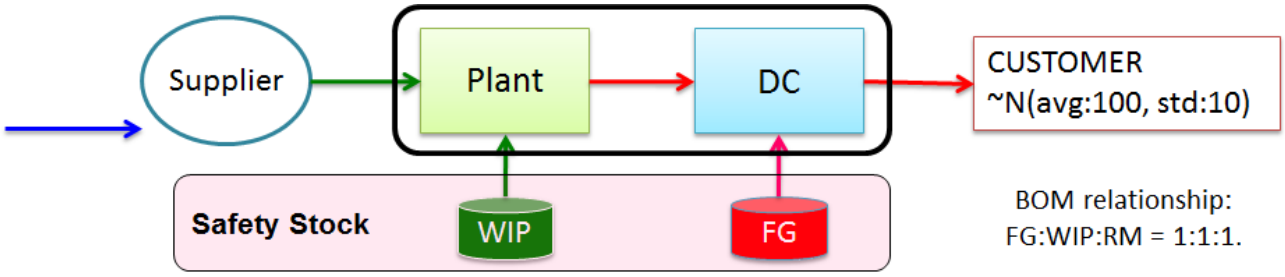
INSTRUCTIONS - SCREAM GAME

The objective of the game is to determine the best robust mitigation strategy that maintains the required service level at the lowest cost in the case of disruptions. The supply chain is as shown below:



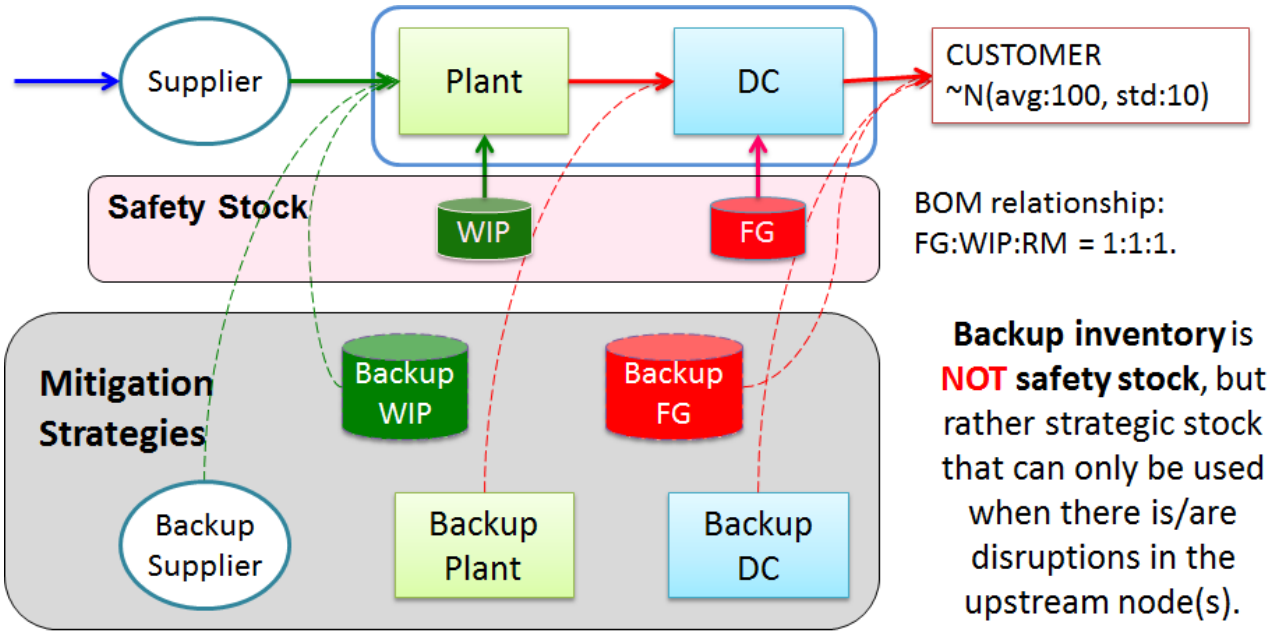
Widget supply chain which consists of:

- Supplier: Receives raw material (**RM**) and converts into work-in-process (**WIP**)
- Plant: Converts the **WIP** into finished goods (**FG**)
- Distribution Center: Stores the **FG** for delivery to customers

You have control over the Plant and the DC, but not the supplier. Each facility has its own safety stock and weekly periodic inventory replenishment policy. Safety stock is set very conservatively – normal fill rate is 99%. Finished goods demand is ~ 100 units/week, holding cost is ~25% annually, and total landed cost is $100 for finished goods, $80 for work in process, and $50 for raw material. The widgets sell for $225 per unit on average.

Backup Mitigation Policies

You have two major types of mitigation options: backup inventory and backup facilities:



Backup / Strategic Inventory

Strategic inventory can be stored as Finished Goods (at a facility separate from the DC) or as Work-In-Process (at a facility separate from the plant). Any amount of inventory can be stored – normal holding costs are applied. It can only be used during a disruption. It is replenished only once a year. Once it is used, it is gone.

Backup Facilities

The DC, plant, and supplier have potential backups that can kick in once a disruption occurs. You must set it up in advance and you pay for it regardless of whether it is used or not. The option cost is a function of both the desired capacity and the speed to respond. There are 7 potential options for each facility:

Backup Option	Capacity Rate	Response time (weeks)	Set Up Fee (for) DC	Plant	Supplier
1	0	-	$ 0	$ 0	$ 0
2	50%	4	$ 1,000	$ 800	$ 400
3	50%	2	$ 2,500	$ 1,800	$ 1,000
4	50%	1	$ 6,000	$ 4,000	$ 2,400
5	100%	6	$ 1,500	$ 1,000	$ 1,000
6	100%	2	$ 6,000	$ 5,000	$ 3,500
7	100%	1	$ 15,000	$ 12,000	$ 10,000

Policy Code [FG@DC / WIP@Plant / DC Option / Plant Option / Supplier Option]

A Mitigation Strategy (5-digit code)

For the game, a mitigation strategy is expressed as a string of five numbers, such as **100/200/1/2/3** which means 100 units of FG backup inventory, 200 units of WIP backup inventory, DC option 1, Plant option 2, and Supplier option 3. In the Demo Spreadsheet, you will express your policy decisions using these five numbers.

Backup inventory	FG inventory	100
	WIP inventory	200
Backup service options	DC backup	1
	Plant backup	2
	Supplier backup	3

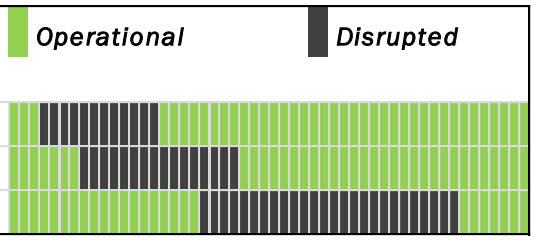
Disruption Scenarios

The operations will be simulated for 52 weeks using weekly time buckets. Disruptions can be caused by any number of different events and can occur at any time during the year. There are only three major effects, however: Shutdown of Supplier Facilities, Shutdown of Plant, and

Shutdown of the Distribution Center. In each case, the facility will be completely closed for a period of time – no less than one week and no more than 52. More than one facility can have a disruption in the course of the year, but a facility cannot have more than one disruption. Disruptions may overlap.

In the Demo Spreadsheet, you can define different scenarios to test different mitigation strategies. The example below describes a scenario in which the DC will be closed for 12 weeks starting in week 4, the Plant will be shut down for 16 weeks starting in week 8, and the Supplier will be disrupted for 26 weeks starting in week 20.

	Disruption		Normal
	Start	Duration	in week
DC	4	12	16
Plant	8	16	24
Supplier	20	26	46



Results

The spreadsheet allows you to specify and test two policies against two scenarios at a time. Results provide the minimum, maximum, and average of several metrics: Total Relevant Cost (inventory holding and mitigation), Item Fill Rate, Lost Sales, Revenue, etc. The results below are for 0/0/1/1/6 policy (only mitigation in place is a backup supplier at option 6) with no disruptions; yours should be close to this. Average total cost is $9,600 with a fill rate of 99.96%.

Results

	Facility Backup Cost	Inventory Carry Cost	Total Relevant Cost	Item Fill Rate	Cycle Service Level	Longest out-of-stock streak	Lost Sales	Revenue
Average	$ 3,500	$ 6,100	**$ 9,600**	**99.96%**	**99.19%**	**0.38**	$ 455	$ 1,166,814
Minimum	$ 3,500	$ 6,100	$ 9,600	99.66%	96.15%	0	$ -	$ 1,133,775
Maximum	$ 3,500	$ 6,100	$ 9,600	100.00%	100.00%	2	$ 4,050	$ 1,192,275

Mitigation Strategy Selection

Once you have selected your policy, you will be given a link to submit your mitigation strategy