Version 7
Dynamic Design Storm Features

Next-Generation Software for Storm and Sanitary Sewer Modeling

To ensure that systems have sufficient capacity into the future, many sewer modeling programs rely on use of historic rainfall data analyzed in sessions simulating periods of many years as the design criteria. Hydra® software takes a totally different approach by testing each pipe in the system against a dynamic design storm – ensuring that the collection system is tested against the perfect storm. Using a dynamic design storm ensures that the collection system is tested against the perfect storm.

Factors to Consider in Design

Municipalities need to ensure that their system will have adequate capacity under a wide range of weather conditions that will likely occur. If the collection system is stressed by rainfall, most models are only capable of simulating the conditions for a specific rain event that occurs at a specific time. But the larger the collection system, the more difficult it is to find a storm that adequately represents the design criteria. There are many factors, including:

- Timing (eg. storm peak at 8:00am vs. 3:00 pm)
- Weather patterns (eg. from the North, vs. from the Southwest)
- Scale (How much of the collection system is affected by the rainfall measured at a single guage)
- Routing (How cumulative flows combine as they travel down the system)
- Landuse (Different shaped hydrographs in different land use zones)

The number of rainfall permutations required to find a rain event that meets the design criteria is significant, notwithstanding the effort it takes to create all the different conditions. The worst-case scenario storm pattern will be different for every pipe in the collection system.

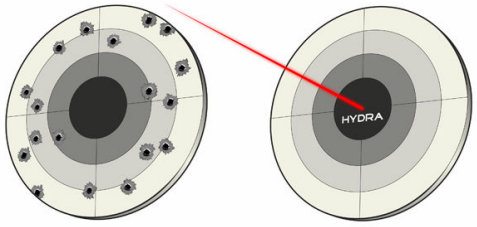
Why not Extended Period Simulation?

"Extended Period Simulation" is a feature that many other models have. The theory behind the extended period simulation approach is that by running enough years of historic rainfall data through the model, all the expected conditions have probably been covered. This is really a **shot-gun approach**; the extra random rain-fall data in the analysis does not guarantee hitting the target. In addition, the distributed rainfall data (requiring many rain gauges) may not be available for the entire period of analysis.

Why not use extended period simulation? Because it is simply not as reliable as Hydra's dynamic design storm.

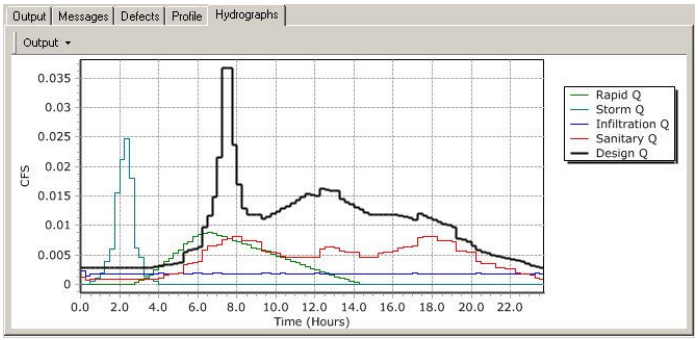
Hydra's Dynamic Design Storm

Hydra® takes a totally different approach to the problem. It uses the peak of the hydrograph for rainfall-derived flows (including stormwater runoff, inflow, and rain-derived infiltration) and automatically aligns it with the peak of the hydrograph for dry weather flows (including sanitary and groundwater infiltration) from selected design storms to find the worst conditions.



Hydra always hits target of optimum design

This automatic alignment, is performed dynamically for every pipe in the system. Hydra® performs this in a way that does not distort the downstream flows and does not compound safety factors. No matter how steep or flat the collection system is, or how many pumps, or how many different land use patterns you have in your service area, Hydra® finds the "worst case scenario" for every pipe, given any design storm. Effectively, Hydra® creates the perfect design storm. In contrast to the shot gun approach of extended period simulation, the dynamic design storm used by Hydra® software is like a shooting at a target with a laser-sighted rifle.



Hydra automatically aligns the peak storm flow with the peak sanitary flow

PIZER
SETTING THE STANDARD IN COLLECTION SYSTEM MODELING

Pizer Incorporated 503 N 36th Street Suite A Seattle, WA 98103 USA
800-222-5332 206-634-2808 sales@pizer.com http://www.pizer.com