



**don't crack under pressure**

# **PE Pipe Applications -Case Story**

**Marmara Earthquake  
İzmir Aliağa Thermal Power Plant**

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**Hakan Belen**



# Marmara earthquake

- In the past we thought that hardness was the unique criteria of durable and lasting systems.

And based on this criteria we estimated lifetime.

Thus, from the last disaster we learnt that there are such powers in the nature, that durability and lifetime depend on being in harmony with them.



# Hard walls

- How hard the walls are, how easily pipes got broken.
- Result: increase in waste product.







- Meaning that when building an infrastructure with hard pipes, risk of loss costs has already been accepted.

# RESULT



# “A waterless city”



## “A waterless city”

- In Adapazarı some lucky districts waited just for the repair. In these infrastructure systems PE100 products were installed.
- What about others? Earthquake result in 70% of the infrastructure systems of Adapazarı being out of order.

# Lifetime



# Lifetime

- Lifetime (no need for maintenance) of an infrastructure system is estimated with lifetimes of each component.
- For example; a pipe's being leak tight depends on its joint's and sleeve's lifetime.























# Corrosion and erosion



# Corrosion and erosion

- Conditions of the terrain are other criterias that affect the life time:
  - Frequent rain,
  - Alkaline and salt rich soil shortens life time of the product significantly.

- Before Marmara Earthquake, “İller Bankası” altered 380km. of Asbestos Cement and PVC pipelines with PE100 pipes in Adapazarı.

- Marmara Earthquake drinking water pipe failure statistics:

| <u>Pipe Type</u> | <u>Failures (pcs/km)</u> |
|------------------|--------------------------|
| Ductile iron     | 0,488                    |
| Cast iron        | 1,508                    |
| PVC              | 1,430                    |
| Steel            | 0,437                    |
| Asbestos cement  | 1,782                    |
| PE 100 Boru      | 0 (no failure)           |



## As a result...

- İller Bankası decided on purchasing PE100 pipes for Adapazarı drinking water pipelines and mains.
- These pipes were only bought from PE100 producers.

## Case Story 2-

# İzmir Aliağa Thermal Power Plant



- PE100 products, are suitable for fire and cooling pipe lines applications. İzmir-Aliaga is one of these kind of Thermal Power Plants, that was built with the collaboration of Enka & Bechtel.



- With this project 11,5% of total electricity demand is aimed to supply.
- In the beginning it was considered on steel pipes. After the presentation, it was decided on PE100.



- All of the fire and cooling lines were built with PE100 pipes and fittings.
- 200-500 mm, PN 16  
800-1000 mm, PN 12,5  
pipes were used
- This project is the second all over the world that 800 mm PN12,5 pipes were used. And the first for 1000 mm PN12,5 pipes.



- Total pipe consumption of the previous mentioned PE100 pipes is 12000 mt.



- Power plant is in use since project finalised in August 2002.





- Various fittings and joints were used.





**THANKS FOR LISTENING.**