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PROJECT: ASU No. 9, KOSICE.

**- ANALYSIS OF ELASTICITY AND STRESS
ACCORDING TO STANDARD ANSI B 31.3**

PIPINGS

700 A 13001 AA10C1S, 700 A 13002 AA10C1S,
 100 A 13003 AA10C1S, 100 A 13004 AA10C1S,
 600 N 15010 AA10C1W, 600 N 15012 AA10C1W,
 100 N 15011 AA10C1W, 100 N 15013 AA10C1W,
 700 A 15001 AA10C1W, 700 A 15003 AA10C1W,
 600 N 15006 AA10C1W, 600 N 15008 AA10C1W,
 100 A 15004 AA10C1W, 500 A 15005 AA10C1,
 700 A 15002 AA10C1, 500 A 15002_1 AA10C1,
 400 A 15015 AA10C1, 200 A 15015_1 AA10C1,
 500 N 20010 AA10C1, 700 N 20011 AA10C1,
 500 N 20012 AA10C1, 500 N 20016 AA10C1W,
 150 A 15009 AA10C1, 600 N 20011_1 AA10C1

CUSTOMER

US Steel, Kosice

MADE BY

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9. Mai 2005

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Summary

The analysis of elasticity and stress is shown for three stress condition:

- WEIGHT
- OPERATION 1H
- OPERATION 1K
- OPERATION 2H
- OPERATION 2K
- OPERATION 6
- WIND in X- and Y-direction
- PESSURE TEST

- Weight
Weight of piping incl. isolation and internals, design pressure.

- Operation
Weight of piping incl. isolation and internals, design pressure, thermal expansion. Temperatures see page 4-5.

- Wind in X- and Y-direction
Horizontal loads of wind according to DIN 1055 with factor of wind 1,2.

The friction at the friction- and guide bearing is calculated with friction coefficient of $\mu = 0,3$.

The result of stress of component nozzles, pipe supports and flanges is part of this calculation.

The calculation is made with the programmsystem ROHR2, Version 30.2a
SIGMA Ingenieurgesellschaft mbH
Beurhausstr. 16 - 18, D-44137 Dortmund

Basis of calculation of design stress and analysis of stress is the calculation code

- AN AMERICAN NATIONAL STANDARD
Code for Pressure Piping, ANSI/ASME B 31.3, Stand 2002

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Design pressures and -temperatures

<u>Design:</u>	press. bar	temp. °C
700 A 13001, 100 A 13003,	6	120/200
700 A 13002, 100 A 13004,	6	120/200
600 N 15010, 600 N 15012,	6	200
100 N 15011, 100 N 15013,	6	200
700 A 15001, 700 A 15003,	6	120/200
100 A 15004, 500 N 20016	6	200
600 N 15006, 600 N 15008,	6	200
500 N 20010, 700 N 20011,	6	120
600 N 20011_1, 500 N 20012,	6	120
400 A 15015, 200 A 15015_1,	6	120
700 A 15002, 500 A 15002_1,	6	120
500 A 15005, 150 A 15009,	6	120

Operation:

load case	Weight, Wind	Op. 1H/Op. 1K	Op. 2H/Op. 2K	Op. 6
pipeline	Temp. °C	Temp. °C	Temp °C	Temp. °C
700 A 13001	200	200/-10	13	200
700 A 13001 after UK15021	50	13	13	50
100 A 13003	200	200/-10	13	200
100 A 13003 after UK15018	50	13	13	50
700 A 13002	200	13	200/-10	200
700 A 13002 after UK15001	50	13	13	50
100 A 13004	200	13	200/-10	200
100 A 13004 after UK15028	50	13	13	50
600 N 15010	200	200/-10	13/-10	200
600 N 15012	200	13/-10	200/-10	200
100 N 15011	200	200/-10	13	200
100 N 15011 (after UK15013 and VK15013)	200	200/-10	200/-10	200
100 N 15013	200	13	200/-10	200
100 N 15013 after UK15023	200	200/-10	200/-10	200

load case	Weight,	Op. 1H/Op. 1K	Op. 2H/Op. 2K	Op. 6
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Wind				
pipeline	Temp. °C	Temp. °C	Temp °C	Temp. °C
700 A 15001	200	200/15	22	200
700 A 15001 after UK15016	65	22	22	65
700 A 15003	200	22	200/15	200
700 A 15003 after UK15026	65	22	22	65
100 A 15004	200	200/15	22	200
100 A 15004 after V15017	200	22	200/15	200
600 N 15006	200	200/15	200/15	200
600 N 15006 after tee 600x600	200	200/15	22	200
600 N 15008	200	22/15	200/15	200
500 N 20010	50	26	26	50
700 N 20011, 600 N 20011_1	50	26	26	50
500 N 20012	50	26	26	50
500 N 20016	50	26	26	50
500 N 20016 after UK15045	50	22	22	50
400 A 15015, 200 A 15015_1	50	26	26	50
700 A 15002, 500 A 15002_1	65	22	22	65
500 A 15005, 150 A 15009	65	22	22	65

Geometry, isometrical construction, Remarks, Supports

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