油气储运 OGST

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综述 / 机械设备 / 输送工艺

/综述/

401 油气管道失效控制技术

李鹤林

在科学技术层面，油气管道失效控制和完整性管理是保障管道运行安全的两项重要工作。管道完整性管理在国内已经受到高度重视，但是失效控制意识却相对淡薄

411 天然气管道调速清管器研究进展

谭桂斌，朱霄霄，张仕民，等

在清管器和内检测器中设计旁通孔和调速装置可以有效地控制其运行速度，控制系统能够实现所需的调速要求

/ 机械设备 /

417 自动回流阀在输油泵保护中的应用

赵来会

泵出口压力通过旁通路中集成的多级节流减压阀降低，降低小流量、高扬程带来的设备振动、阀门锤击等不利影响

/ 输送工艺 /

419 热油管道间歇输送热力水力特性

柳歆，张劲军，宇波

采用二阶有限容积法对土壤导热方程、结蜡层、管壁和防腐层导热方程进行离散，采用 Gauss-Seidel 方法求解离散方程

万方数据

设计计算 / 安全消防 / 线路工程

/设计计算/

423 管输天然气气质的相特性

王玮,张晓萍,李明,等

气样 I 中 C_7、C_8 组分含量相对较高,即便重组分总量略低,但其对天然气相特性的影响已超过气样 J 中较多 C_6 组分的贡献

427 多相混输管道 90° 弯管冲蚀破坏应力分析

杜明俊,晁玲,付晓东,等

多相流混合模型不仅适用于计算相间存在滑移速度的多相流动,而且适用于计算有强烈耦合的各向同性和各相异性的多相流动

431 节点分析在地下储气库注气动态分析中的应用

李明川,黄全华,孙雷

根据储气地层中部深度为 1 388.2 m,计算得到形成垂直裂缝的压力为 23.5 MPa,形成水平裂缝的压力为 33.4 MPa

435 花格管道年输量 400×10^4 t 运行参数计算

蒋玉卓,于方涌

基于原油的粘温曲线、泵的特性曲线、加热炉功率分析花格管道年输量增至 400×10^4 t 时,冬夏季不同工况下管道沿线的运行参数

/ 安全消防 /

438 烯烃输送管道建设与运行的安全环保问题

侯学瑞,张艳彩,李珍,等

同沟敷设采取分层布置管道的措施,气相乙烯管道置于管沟上方,液相丙烯管道置于管沟下方,并尽可能减少外力对气体管道的破坏

/ 线路工程 /

441 新建大落差管道试压排水爆管原因

罗金恒,杨锋平,马秋荣,等

排水作业进行约 36 h,两个压力传感器在排水的最后 4 min,检测到明显的压力信号,峰值约为 1.75 MPa

万方数据

施工技术 / 实践天地 / 节能环保

/ 施工技术 /

445 川气东送管道野三河跨越方案比选与实施

高河东,祁志江,任金岭,等

针对悬索桥跨越方案开展大比例节段模型涡振试验、三分力试验及全桥气弹性模型风洞试验,确定主要参数、关键控制点和监控措施

449 抬管技术在通过采空区管道的应用

么惠全,冯伟

根据结构力学理论,计算所有载荷引起的管系中个点的位移,再进行柔度矩阵计算,求出管辖中各约束点恢复到原来位置或某指定位移量对应位置所需施加的载荷

453 桁架式跨越通过高地震烈度区的抗震分析

胡道华,杨晓秋

在动力分析中可以将流体动压力对结构的影响作为附加质量进行处理,并根据随机振动理论进行频域上的动力分析和可靠度分析

/ 实践天地 /

456 输油管道泄压阀渗漏原因与应对措施

卢连勇,张明红,王金鹿

锥头复位不到位、密封部件老化、油品含有杂质均易造成密封面损坏,导致密封不严,引起泄压阀渗漏

458 原油储罐在线清罐实践

周会萍,王凯,胡江锋

热油不断进入储罐,持续融化、卷携、抬升罐内油泥,使储罐内已经形成的自罐底向上的由大到小的胶粒层次逐渐被打乱

/ 节能环保 /

460 原油变频超流量节能外输技术及其应用

付秀勇,陈朝,崔新辉

频率由50 Hz降至35 Hz后,变频器的效率和电机功率因子相应增加,电机转速、电流、温度和泵运行的噪音成比例下降,泵体也未出现结盐的问题

万方数据

经验交流 / 问题讨论

/经验交流/

465 三塘湖原油管道水击保护措施

方爱国，薛海鸿

当发生水击时，按照水击保护系统中事先设置的逻辑控制程序向各站场发出指令，紧急停运油泵，关闭相关阀门

467 输气管道冻胀原因分析与治理

郑晓明，王晓燕，闫杰，等

管道长期低温运行和管道埋深处土壤含水丰富，是造成管道冻胀的原因

468 油罐内浮盘密封失效原因与预防措施

聂世全，崔振兴，王伟峰

油罐内浮盘"静"密封失效，即"大油气空间"泄漏，油气挥发速度比同条件下固定顶油罐快得多

472 广东潮州大型LPG冷库建设

唐平，关志永，石睿，等

储罐在充水预压期间，环梁最大沉降量为73 mm，地基深层土体的水平位移量微小，最大超静孔隙水压力为20 kPa

474 西气东输盐池站压缩机组远程控制系统优化

魏凯，唐善华，闫峰，等

在SCS程序中，将所有导致停机的报警信号延时5 s，避免因测量值短时波动引起的非正常停机

476 钢制拱顶油罐罐顶排水系统的改造

刘洪，李广良，南书停

通过修改设计规范和利用油罐大修的机会进行钢制拱顶油罐的改造，并增加专用排水管解决罐顶的排水问题

/ 问题讨论 /

478 油气回收装置在油库混油处理中的应用

马国光，刘苏，林辉，等

经试验改造的减压蒸馏装置处理后的柴油闪点可达50 ℃以上，闪蒸分离效率达到80%～90%

万方数据

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OVERVIEW / MECHANICAL EQUIPMENT / TRANSPORTATION PROCESS

/OVERVIEW/

401 Failure control technique of oil & gas pipeline

Li Helin

In the technological level, both of pipeline failure control and integrity management are important work to secure pipeline safety. High attention has already been paid on integrity management while failure control lags behind.

411 Study progress in variable speed pig for natural gas pipeline

Tan Guibin, Zhu Xiaoxiao, Zhang Shimin, et al

Bypass passway and variable speed apparatus designed for pig and PIG (pipeline inspection gauge) can effectively control their travelling speed, and the control system can achieve desired requirements in speed regualation.

/MECHANICAL EQUIPMENT/

417 Application of automatic recirculation valve in pump system protection

Zhao Laihui

Pump outlet pressure is reduced by integrated multistage pressure release valve in bypass pipe. As a result, some negative influences like vibration and valve surge caused by low flowrate and high lift can be reduced.

/TANSPORTATION PROCESS/

419 Thermodynamic and hydraulic characteristics of hot oil pipeline under the intermittent transportation process

Liu Xin, Zhang Jinjun, Yu Bo

Binary limit volume method is used to carry out discrete calculation on the heat conduction equation of soil and the equation of wax deposit layer, pipe wall and coating. Gauss-Seidel method is used to solve the discrete equations.

万方数据

DESIGN & CALCULATION / SAFETY & FIRE CONTROL / PIPELINE ROUTE ENGINEERING

/DESIGN & CALCULATION/

423 Investigation on phase behavior of the pipelining natural gas

Wang Wei, Zhang Xiaoping, Li Ming, et al

There are relatively higher C_7 and C_8 components in sample I although their total heavier components are slightly low, their influence on the phase behavior of natural gas is beyond the contribution that the more C_6 component in sample J made.

427 Analysis of erosion fracture stress of 90° elbow in multi-phase mixed transmission pipeline

Du Mingjun, Chao Ling, Fu Xiaodong, et al

Mixture model for multiphase flow is both applicable for the calculation of the multiphase flow with slip velocity amid interphases and the isotropic and anisotropic multiphase flow with strong coupling.

431 Application of node analysis in dynamic analysis of underground gas storage filling system

Li Mingchuan, Huang Quanhua, Sun Lei

Considering the depth of middle strata is 1388.2 m, the pressure to form the vertical crack is 23.5 MPa, the pressure to form the horizontal crack is 33.4 MPa.

435 The operation parameter computation of Huatugou-Golmud Oil Pipeline with a throughput of 400×10⁴ t/yr

Jiang Yuzhuo and Yu Fangyong

Based on the viscosity-temperature curve of crude oil and the performance curve of pump as well as the power of heater, the operation parameters of the pipeline system were calculated under different operating conditions respectively in winter and summer when the throughput of Huatugou-Golmud Oil Pipeline was up to 400×10^4 t/yr.

/SAFETY & FIRE CONTROL/

438 Safety and environmental protection on construction and operation of olefin pipeline

Hou Xuerui, Zhang Yancai, Li Zhen, et al

Different from the parallel pipe laying design, laying-in-one-ditch technique with the vertical design was adopted for the two pipelines, which gas phase ethane pipeline was located at the top side of ditch, liquid phase propylene pipeline was located at the bottom side of ditch in order to decrease the external force damage on the gas phase pipeline.

/PIPELINE ROUTE ENGINEERING/

441 Reason analysis on pipe fracture in hydrotest during water draining for a newly-built pipeline with great fall

Luo Jinheng, Yang Fengping, Ma Qiurong, et al

The drainage operation lasted about 36 h, the obvious pressure signal was detected by two pressure sensors in the last 4 minute of drainage, and the peak value was about 1.75 MPa.

万方数据

CONSTRUCTION TECHNIQUE / APPLICATION REPORT / ENERGY SAVING & ENVIRONMENTAL PROTECTION

/CONSTRUCTION TECHNIQUE/

445 Programs comparison and construction of the Yesanhe River Overhead Crossing NG Project of Sichuan-to-East Gas Pipeline

Gao Hedong, Qi Zhijiang, Ren Jinling, et al

Carrying out the vortex vibration testing with large-scale section model, three-component testing and wind tunnel testing with full bridge aeroelastic model for the overhead crossing project with suspension bridge was necessary, which was very helpful to determine the main parameters, key control points and monitoring measures.

449 Application of pipe lifting methodology in the pipeline across the goaf

Yao Huiquan and Feng Wei

The displacement of single node in pipeline system caused by all the loads can be calculated and then the flexibility matrix can be calculated based on the structure mechanical theory; and the required applied loads for each constraint node in pipeline system backing to the original location or the location which is a corresponding specified displacement can be obtained.

453 Seismic analysis on the truss overhead crossing pipeline across high-intensity earthquake area

Hu Daohua and Yang Xiaoqiu

The effect of hydrodynamic pressure on structure could be processed as added mass in the dynamical analysis, and the dynamical analysis and reliability analysis of frequency domain were carried out on the basis of the random vibration theory.

/APPLICATION REPORT/

456 The leakage in relief valve of oil pipeline and solutions

Lu Lianyong and Zhang Minghong

Conehead failed to reset, sealing parts aging and sealing surface damage due to the impurities in oil resulted in sealing failure and leakage of relief valve.

458 Practice of in-service tank cleaning of crude oil tank

Zhou Huiping, Wang Kai, Hu Jiangfeng

Hot oil was injected continuously into oil tank and keeps a constant to melt, roll with and upraise the dead oil to make the gel particle layer formed gradually from the bottom to top of tank upset.

/ENERGY SAVING & ENVIRONMENTAL PROTECTION/

460 Apply variable frequency pump system to transport ultra-throughput crude oil

Fu Xiuyong, Chen Chao, Cui Xinhui

Frequency converter's efficiency and motor's power factor are relatively increased after the frequency is deceased from 50 Hz to 35 Hz. The rotation speed, current, temperature of motor and the running noise of pump are proportionally decreased, and also, salt deposition in pump body has not been found.

万方数据

EXPERIENCE EXCHANGE /QUESTION DISCUSSION

/EXPERIENCE EXCHANGE/

465 Measures in surge control in Santanghu Oil Pipeline

Fang Aiguo and Xue Haihong

When surge occurs, the order set in PLC of surge control system is sent to every pump station to urgently shut down pumps and associated valves.

467 Freezing bulge analysis and countermeasures for gas pipeline

Zheng Xiaoming, Wang Xiaoyan, Yan Jie, et al

Long-term running under low temperature and full of water content around underground pipeline are the freezing bulge reasons of gas pipeline.

468 Seal failure causes and prevention measures of inner floating deck of oil tank

Nie Shiquan, Cui Zhenxing, Wang Weifeng

Static seal failure of inner floating deck of oil tank, or the leak of external oil and gas space, can get the evaporation rate of hydrocarbon much faster than that of fixed roof oil tank.

472 Construction technique in Chaozhou LPG Freezer of Guangdong Province

Tang Ping, Guan Yongzhi, Shi Rui, et al

During the hydrotest, the maximum settlement of ring beam of tank was up to 73 mm, the horizontal displacement of deeper soil of tank base was slight, and the maximum superstatic pore water pressure was at 20 kPa.

474 Optimization of remote control system of Yanchi Compressor Station in West-to-East Gas Transmission Pipeline

Wei Kai, Tang Shanhua, Yan Feng, et al

In the SCS procedure, all the warning signals resulted in the shutdown of gas compressor were delayed 5 sec. in order to avoid non-normal shutdown due to the instantaneous fluctuation of measured value.

476 Technical transform on the drainage system of steel dome-roof oil tank

Liu Hong, Li Guangliang, Nan Shuting

It is necessary to mend the design standards of tank, or rehabilitate the drainage system of tank during overhaul. Drainage of rain water can be done by means of special drainage tube set up in the top of tank.

/QUESTION & DISCUSSION/

478 Application of oil contamination recovery unit of tankfarm

Ma Guoguang, Liu Su, Lin Hui, et al

Flash point of diesel oil treated via modified vacuum distillation unit reached over 50 ℃, and flashing separation efficiency achieved at 80%~90%.

万方数据