

Commencement Ceremony of the SafeChina Project 安全中国项目成果总结会暨证书授予仪式



会议手册

Conference Manual



January 12, 2013, Beijing
Beijing Municipal Institute of Labour Protection
北京市劳动保护科学研究所



德中合作“安全中国”培训项目成果总结会 暨证书授予仪式



2013 年 1 月 12 日
中国·北京
北京市劳动保护科学研究所

议程安排

主持人：北京市劳动保护科学研究所 汪彤副所长

议程：

- | | |
|---------------|--|
| 8:30 - 9:00 | 注册 |
| 9:00 - 9:10 | 北京市劳动保护科学研究所张斌所长致欢迎辞 |
| 9:10 - 9:20 | 项目资助单位德国 DEG 公司中国区负责人 Oliver Harms 先生讲话 |
| 9:20 - 9:30 | 项目主持单位柏林斯泰恩拜斯大学代表讲话 |
| 9:30 - 10:00 | “安全中国”项目成果汇报
(Aleksandar Jovanovic 教授，项目负责人)
“安全中国”项目后续合作介绍
(刘艳博士，北京市劳动保护科学研究所) |
| 10:00 - 10:10 | 国家外国专家局出国培训管理司张冬处长讲话 |
| 10:10 - 10:20 | 北京市安全生产监督管理局常纪文副局长讲话 |
| 10:20 - 10:30 | 北京市科学技术研究院丁辉院长讲话 |
| 10:30 - 10:40 | 国家安全生产监督管理总局国际合作司柏然司长讲话 |
| 10:40 - 11:05 | 颁发证书 |
| 11:05 - 11:20 | 休息 |
| 11:20 - 11:40 | 特约报告：全球化技术变革对风险治理、知识网络和学习的影响
(Manuel Heitor 教授，国际风险治理理事会葡萄牙研究中心) |
| 11:40 - 12:00 | 特约报告：应对全球风险的教育需求
(Ortwin Renn 教授，德国斯图加特大学) |
| 12:00 | 汪彤副所长宣布项目成果总结会暨证书授予仪式结束 |
| 12:15 | 午餐 |

北京市劳动保护科学研究所

北京市劳动保护科学研究所成立于 1956 年，为市属公益型研究所，是我国第一家经国务院批准成立的从事安全、环境与职业卫生领域研究的综合性科研机构。50 多年来，劳保所不断探索、实践，为新中国劳动保护事业的发展书写了辉煌的篇章。经过半个多世纪的发展，劳保所在城市公共安全、安全生产与劳动保护、人居环境三个重点领域建立了 6 个省部级专业技术研究机构和检测中心，为基础性、应用性、前瞻性的研发工作奠定了坚实的基础。近十几年，劳保所共取得科研成果 100 多项，其中包括一批国家攻关项目，80% 以上的为国内首创或具有国内先进水平，25% 的科研成果接近或达到国际先进水平。

现在，劳保所拥有科研、办公用房 15000 平方米，仪器设备千余台（套），占全所职工 80% 以上的中高级职称的专业技术人员。资产总额上亿元。劳保所还拥有安全科学与工程、公共卫生与预防医学两个硕士学位一级学科点，是国务院学位委员会批准的全国第一批硕士学位授予权单位之一，还设有博士后工作分站。目前，劳保所和北京大学、清华大学、中国科学院、美国哈佛大学、美国华盛顿大学、英国格林威治大学、香港理工大学等高校和科研机构建立了长期紧密的合作关系和技术交流平台，并主办国内外公开发行的《安全》科技期刊杂志。

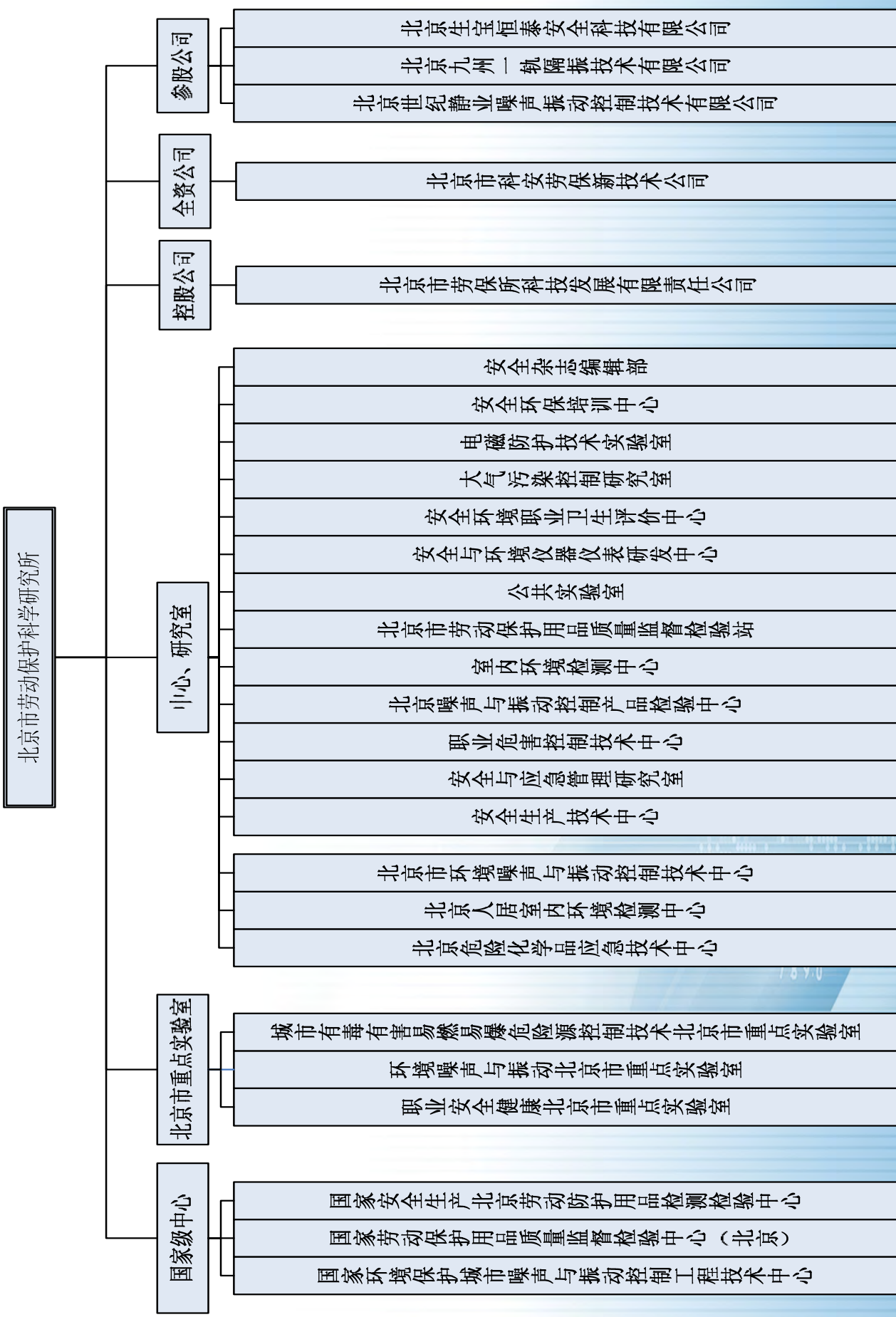


“十一五”期间，劳保所先后在城

市区域公共安全风险评估、安全生产形势统计分析预测预警技术、职业危害

检测与防治关键技术、人群风险预测预警、地铁隔振、轨道安全健康监测等领域研究取得了重要成果，在原有国家劳动保护用品质量监督检验中心、北京危险化学品应急技术中心、北京人居室内环境监测中心、劳动安全卫生评价中心、北京市环境噪声与振动控制工程技术中心基础上，本着科技创新、产业化、技术服务发展的新需要，紧紧抓住建设“中关村国家自主创新示范区”的重大机遇，大力建设以国家环境保护城市噪声与振动控制工程技术中心、城市有毒有害易燃易爆危险源控制技术北京市重点实验室、职业安全健康北京市重点实验室、环境噪声与振动北京市重点实验室等为核心的科技创新体系。

50 多年来，劳保所全体员工锐意进取，成就了今日的辉煌。今天，我们将按照“十二五”发展规划的要求，以“需求引导、合作创新、抢占先机、做大产业”为指导思想；以“增强创新能力，服务首都建设”为宗旨，以“公益科技服务社会”为发展方向。围绕科研创新，科技成果产业化和为政府、为企业提供服务三个重点任务，在巩固现有科研领域领先优势的基础上，不断拓展新的研究方向，探索新的经济增长点，做大产业规模。力争在“十二五”末期形成创新驱动发展的新局面。以优秀的科研成果为国家和北京市的社会发展提供技术支撑。在服务首都经济和社会发展的道路上创造新的辉煌。



斯泰恩拜斯先进风险技术集团

斯泰恩拜斯先进风险技术集团（R-Tech）是斯泰恩拜斯集团的一部分。目前有超过 700 个斯泰恩拜斯团队在全球 50 多个国家开展创新管理与技术转移领域的活动。致力于“先进风险技术”研究的斯泰恩拜斯团队，解决不同领域的各类风险问题。涉及的领域或行业主要有石油化工和加工厂、发电厂和能源供应、新材料技术、新技术或可替代技术等。风险类型包括创新风险、业绩低于预期值的风险、预期外风险、超出产品和技术生命周期的风险、项目风险等。围绕这些研究工作，积极组织欧洲及国内的利益相关方、推动和支持技术转移、引进风险管理的新方法、开发特定的方法和工具等。

斯泰恩拜斯先进风险技术集团也是欧洲经济利益体——欧洲综合风险管理虚拟研究院（EU-VRi）的五个创始成员之一。能够运用自身或斯泰恩拜斯网络、欧洲综合风险管理虚拟研究院、欧洲工业安全技术平台（ETPIS）等资源共同开展研究工作。斯泰恩拜斯先进风险技术集团参与的欧盟第七框架计划项目主要涉及新技术相关的综合风险管理、航天工业领域纳米容器技术、新生物燃料和涂层技术的风险等。

为了提供最优服务和取得最好的效果，斯泰恩拜斯先进风险技术集团致力于“先进风险技术”这一特殊领域，业务领域包括技术转移、教育、研发、以市场为需求的咨询服务和与欧盟相关的问题。斯泰恩拜斯先进风险技术集团开发的用于石油和电力行业的大型网络系统——综合风险管理系统（iRiS），已应用于全世界。斯泰恩拜斯先进风险技术集团还支持欧洲工业安全技术平台，协调新兴风险领域的各项研究活动，并引领制定基于风险检测领域的欧盟标准。



德中合作“安全中国”项目

安全中国项目是由德国政府 DEG 公司和柏林斯泰恩拜斯大学先进风险技术转移研究院共同投资 40 万欧元的培训项目，旨在通过聘请资深欧洲专家传授欧盟在工业安全与环境保护领域的相关法律法规、标准和具体实践方法，促进中国相关领域人员了解欧盟先进管理理念和技术，推动中国工业安全与环境保护工作的发展。安全中国项目的主要目标是建立专业人才教育培训和资格认证体系，经过培训的专业人士能够根据欧盟标准引入风险管理，在中国的产业界发挥重要作用。

安全中国项目由柏林斯泰恩拜斯大学先进风险技术转移研究院和他们在中国的唯一战略合作伙伴北京市劳动保护科学研究所共同组织实施。在项目执行过程中，有 20 家中国单位作为支持方通过北京市劳保所与柏林斯泰恩拜斯大学先进风险技术转移研究院签署了合作协议。德国和欧盟国家的 BASF、DEG、DEKRA 和 GVG 等单位也作为支持方加入到了项目中。

安全中国项目自 2010 年底启动，计划在 2 年的项目执行期中完成以下主要目标：

- 1) 至少举办 10 门课程；
- 2) 200 名学员参与以上课程；
- 3) 100 名学员通过以上课程的考试，取得柏林斯泰恩拜斯大学颁发的资格证书；
- 4) 20 名学员获得柏林斯泰恩拜斯大学颁发的风险审查师或风险评估师资格证书；
- 5) 5 名学员成为安全中国课程的中国讲师。

截至目前，“安全中国”项目已圆满完成项目任务书要求的各项内容，取得的成果主要有：

1) 该项目分别在北京市劳动保护科学研究所、中国石化北京燕山分公司培训中心、首都经济贸易大学安全与环境工程学院和中国石油大学机械与储运工程学院举办了 14 期课程，培训了近 500 名中国学员，并有 96% 的学员成功通过了考试。培训的课程包括：《工业中的风险及安全管理概述》、《电力行业风险分析》、《石油化工行业风险分析》、《石化行业基于风险的检测》、《基于可靠性的维修保养与根本原因失效分析》、《健康、安全、保障与环保》、《业务连续性风险与保险》、《防火》、《职业安全健康》、《生命周期评估》和《新兴风险管理》等；

2) 14 名学员赴欧洲参加了 2012 年 4 月 22 日至 30 日的在职培训，参观了德国的 DEG、GVG、BASF、Steinbeis、DEKRA、EnBW 电厂和瑞士安全研究院等；

3) 3 名学员赴德国分别进行了 3 个月、半年和 1 年的长期培训和交流；

4) 21 名学员经过认证，获得了柏林斯泰恩拜斯大学认可的风险审查师或风险评估师资格；

5) 19 名符合条件的学员参加了培训教师的课程，16 名学员成功通过了笔试和口试，取得了培训师资格；

6) 首都经济贸易大学安全与环境工程学院已同意将部分安全中国课程纳入研究生教学计划，课程《新兴风险管理》已于 2012 年 11 月组织实施；

7) 共计近 500 人次取得了柏林斯泰恩拜斯大学颁发的各类资质证书。

2013 年 2 月底项目结束后，斯泰恩拜斯先进风险技术集团和北京市劳动保护科学研究所还将继续携手，以“安全中国”成果为基础，以实际需求为导向，双方优势互补，资源共享，在风险管理领域开展更密切的合作。

课程介绍

模块 I：概论 – 工业中的风险

概论包括 3 门课程，涵盖了不同类型工业企业中的风险管理原则和风险分析方法。主要内容有工业安全方面的欧盟法令、重大事故防范、应用于石油化工和电力行业的风险评估方法，以及环境和人类健康危害等。课程一方面讲授法律法规、风险识别及分析方法的理论基础，另一方面也将大量引用工业安全领域的实例和新近发生的事件。

I-R01：概论：风险管理介绍

本课程从风险的不同方面和风险领域的术语开始阐述，并涵盖了工业安全领域的主要问题，重点阐述了相关的欧盟法令。课程概述了风险管理的目标、范围以及应对突发事件和污染危害所需的措施和责任，特别说明了重大事故防范和相关的过程安全风险评估方法。

I-R02：石油：石油化工行业的风险分析

石油工业迅猛发展，很多组织和个人都面临着紧跟发展，从风险中寻找机会的挑战。本课程介绍了当今石油化工行业的全球性和地区性的问题，主题包括风险的各个方面和应用于石油化工行业的危害辨识方法、可能性和结果分析、风险评估以及与石油化工行业相关的安全与环境问题。

I-R03：电力：电力工业的风险分析

本课程从应用风险分析的优势和有效性入手，阐述专门应用于电力行业的风险分析知识。课程介绍了基于法规的要求，并通过大量实例详细说明了风险分析的常用方法。

模块 II：基于资产 / 工厂的风险管理

本部分由 3 门可选的必修课程组成。基于资产和工厂的风险管理课程首先介绍了石油化工和发电行业中基于风险的检测原理，并依据主要的标准文件，如 API RP 580 和 API 581，阐述了最重要的方法。基于风险检测的课程提供了应用方法和工具的最新知识。这一部分还讨论了在维护和事故防范中的决策方法，同时展示了不同行业中大量的实例。

II-R04a：RBI-PETRO：基于风险的检测 – 石化行业

本课程详细阐述了石油化工行业的风险问题，讲解了基于风险的检测原理，并介绍了目前基于风险的方法和现行的法规标准，课程重点是美国石油学会的主要参考文件 API RP 580 和 API 581。

II-R04b：RBI-POWER：基于风险的检测 – 电力行业

本课程介绍了目前应用于电力行业基于风险方法的最新知识，适用于常规发电行业中的各种专业人员。

II-R05：RCM&RCFA：以可靠性为中心的维护与根本原因失效分析

本课程介绍了以可靠性为中心的维护（RCM）与根本原因失效分析（RCFA）两种方法分析确定设备的维护需求与决策过程，课程重点是不同行业设备的损害机制，并介绍了大量实例。

模块 III：基于健康、安全、保障和环境 / 危害的风险管理

本部分重点介绍了基于危害的风险管理，包括 7 门课程，涵盖了对单一企业，尤其是石油化工、电力行业企业中对健康、安全、保障、环境和事故、后果模型的一般介绍，以及对防火防爆 / 模型、化学品及化学品运输相关风险、职业安全健康方面的具体问题的讲解。

III-R06：HSSE：健康、安全、保障和环境

本课程概述了健康、安全、保障和环境领域的欧盟法令，并讲解了欧盟法令的目标、要求和在最新实践中的限制和优势，重点介绍了综合污染预防和控制（IPPC）、工业排放规定（IED）以及重大事故的防范（Seveso II）。

III-R07：CoF：事故及后果模型

本课程介绍了事故建模的一般方法和爆炸的各种模型，并通过实例阐述了气体、蒸气爆炸模型和气体扩散建模。课程还包括火灾建模和目前的火灾模型介绍。

III-R08: FIRE: 消防

本课程从灭火机理开始阐述防火原理，并详细介绍了法律背景和要求以及防火概念，重点是工业火灾和风险分析。课程介绍了火灾建模的基本原理和应用，讲解了火灾现象，概述了火灾模型，并通过大量实例和计算说明了不同火灾模型的应用。

III-R09: ExP: 防爆

本课程详细介绍了欧盟法令 ATEX 和防爆的基本原理，并通过一系列实例阐述了工业企业中防爆的实际应用。

III-R10: REACH: 化学品的风险分析

本课程介绍欧盟法规 REACH (EC Nr. 1907/2006) 对化学品注册、评价和许可的原则，讲解了制造商、进口商和下游使用单位为确保其生产、销售或使用的化学品不会对人类健康或环境造成负面影响而应尽到的职责。

III-R11: ADR: 危险品运输

本课程介绍了国际和欧盟关于危险品运输的政策和立法要求，讲解了关于国际危险货物运输的欧洲协定，并阐述了危险品运输的主要问题以及一旦发生事故的应急措施和程序。

III-R12: OSHA: 职业安全与健康

本课程讲解了职业安全与健康领域的欧盟法令，包括预防职业风险、保护安全与健康、消除风险和事故因素、告知、协商、与国家法律法规协调一致、工人及其代表培训的一般原则，以及实施上述原则的指南。

模块 IV: 基于商业 / 治理的风险管理

本部分包括商业持续性风险、风险治理理念、企业的社会责任与可持续发展、生命周期分析与评估、新兴风险以及商业交流和文化差异。本部分从另一个角度讲解风险问题，是对石油化工和电力等行业侧重于风险管理技术和工程问题课程的补充。

IV-R13: BUSINESS: 商业持续性风险与保险

本课程是对石油化工和电力等行业侧重于风险管理技术和工程问题课程的补充。技术风险是商业持续性风险的一个因素，技术 / 工程活动的最终效果通常也可以从商业迹象和商业活动的暗示 / 影响中体现出来。保险是连接工程和公司运营、资产管理等商业部分最相关的内容。

IV-R14: iCSR&S: 综合性企业的社会责任与可持续发展

本课程介绍了企业的社会责任 (CSR) 和在工业中的实践应用。课程从 CSR 的关键要素开始，重点讲解了 CSR 的方法和工具及现代工业实践 (HSE, HSSE) 的有关技术。分析对比了欧盟、美国及其他国家的实践和有关数据信息，并阐述了全世界最好的实践，包括大量重要行业的案例研究和相关的数据信息参考。课程专门阐述了新的 ISO260000 标准。

IV-R15: RGOV: 风险治理

现代风险监管的要素 (IRGC 框架) 包括 a) 预评估, b) 风险评估, c) 风险特征描述和评价, d) 风险管理和电子风险沟通。本课程介绍了每一个要素，如风险评估中的危害辨识与评估、暴露和脆弱性评估、风险评估、暴露和社会关注度、社会经济影响，展示并阐述了工业实践的实例。本课程专门阐述了特殊的方法和技术以及便于行业、政府和公共团体应用的工具和设备。

IV-R16: LCA: 生命周期分析与评估

本课程能够提高参加学员生命周期评估 (LCA) 的知识，并获得进行简单 LCA 研究以及分析、探讨和评论 LCA 国际学术论文的技能。课程全面概述了生命周期评估 (LCA)、生命周期成本 (LCC)、国际参考生命周期数据系统 (ILCD) 和欧洲参考生命周期数据系统 (ELCD)，重点阐述了工业中应用 LCA 的实例以及提高产品和服务的环保性和可持续性。

IV-R17: EmRISK: 新兴风险

本课程介绍了新兴风险和新兴风险管理。“新兴”主要是指以前没有作为风险被识别出的风险，如新过程、新技术、新方法或社会组织的变化（如纳米技术、生物技术、新化学品、外包、全球化等）带来的风险。课程还介绍了由于公众意识改变或新科技知识产生的已知新兴风险。

IV-R19: BC&M: 商业交流和文化差异管理

在日益发展的全球化趋势下，文化差异和多种语言是商业交流领域的重要问题。文化差异在商业交流领域尤其重要，并能在一般问题上导致失败，这在国际项目的合作中尤其重要。本课程的目的是保证工程师、经理、IT 专家能够理解与不同文化背景的同伴合作成功的重要性。课程培训过程中采用了整体认知方法以识别和管理文化差异。对这一主题感兴趣的任何个人或中小型企业都可选择本课程。

模块 V: 附加课程

本部分提供了 15 门不同主题的附加课程，是对其他部分课程中一些主要问题的深入讲解。这些课程不仅回顾了基本知识，而且扩展了对个人利益或职业生涯重要的某些特殊领域的知识。本部分还包括新兴风险问题和处理与新技术相关的新兴风险的过程、工具和方法以及发展现状。

V-R21: S&RA: 安全和可靠性分析

本课程介绍了安全和可靠性分析的基本理论，从可靠性和风险分析的定义和对基本概念的讨论开始，介绍了定性方法，如函数分析、故障模式影响与危害度分析以及故障和危害的识别与评估，还介绍了定量方法，如可靠性框图、事故与事件树分析和马尔科夫方法。课程特别介绍了功能安全系统（IEC61508），通过一般原因失效进行系统分析尤为重要。课程最后介绍了失效率评估方法和可靠性数据源调查。

V-R26: QRA&A: 定量风险评估和高级应用

本课程介绍了定量风险分析，描述了计算风险指数的必要步骤，讨论了包括脆弱性模型的频率计算和后果评估的实践方法，重点介绍了多米诺效应和自然科技事件引发的意外事故。

V-R27: PubHealth: 基于风险分析的公共健康

本课程通过专用术语和风险的不同方面涵盖了基于风险分析的健康问题。课程用大量实例进行描述，并介绍了常用方法，特别介绍了以下问题：（1）风险的基本原理：分析、评估和管理，（2）风险分析的角度（风险的措施），（3）量效函数，（4）风险感知和交流，（5）可变性和不确定性，（6）累积风险评估，（7）风险评估、管理和法律，（8）应用于公共健康的 WHO 方法。

V-R28: RBIcon: 工业中的 API RBI 概念

本课程重点介绍了美国石油学会的 API 581 标准及其在石油化工行业的应用，阐述了 API 581 的基本概念，并解释了基于风险检测的原理。

V-R29: P&C: 设备失效的概率及后果

本课程重点介绍了 API 581 标准定义的基于风险检测的方法用于石油化工行业的检测计划。课程通过定量过程用基于风险的方法为加压固定设备建立检测程序，程序包括失效概率和后果的计算以及基于风险评估的风险分析和检测计划。课程中的加压固定设备涵盖了压力容器、管道、油罐、泄压装置和换热器等。

V-R30: CAA: API 基于风险检测评估的后果分析

本课程介绍了如何按照标准 API RP 581:2008，计算失效后果。为更好的理解课程内容，课程从一般定义开始介绍，通过实例讲解计算方法。

V-R31: BasicRIMAP: CWA 15740 RIMAP - 基本原理

本课程重点介绍了 CWA（CEN 协议）15740:2008 文件，基于风险的检测和欧洲工业的维护过程（RIMAP）。课程解释了发展欧洲程序的原因以及对比 API 基于风险检测方法的优势和不同。

V-R32: ISO31000: ISO31000 基本原则和管理

本课程详细介绍了国际标准化组织（ISO）编写的国际标准 ISO 31000:2009，阐述了风险管理原则之间的关系以及标准中描述的框架和过程，并涉及了在工业中标准的适用性。

V-R33: RBI PoF: 基于风险检测的失效概率 - 损坏因子

本课程重点介绍了不同行业中出现的损坏机制和对计算设备失效概率的影响，并详细介绍了大量的实例。

V-R34: RP&C: 风险感知和风险沟通

本课程介绍了风险感知和风险沟通的理论背景和最新的研究问题。本课程为相关领域的理论成果、各种实例和内部培训等工作的进一步发展提供了坚实的基础，重点是沟通过程的理解和风险与危害信息沟通技术的提高，以基于团队工作的练习作为补充。

V-R35: TRA: 运输风险评估

本课程介绍了运输风险分析，阐述了危险物品的公路、铁路和管道运输的风险评估，讨论了频率计算、后果评估和风险评估的方法。本课程将通过案例研究讲解个人、社会和其他高级风险指数的计算和使用。

V-R36: IRM: 创新风险管理

新产品和新技术的发展具有风险性和不确定性，新技术的成功不仅在于创新的理念，更在于从理念到产品和服务创新过程的成功管理。创新的管理是一个严格的过程，从产品性能达到目标特征到成功进入市场，包括严格的、层层审批的过程和每一个关键因素的定期考量。

V-R37: VA&PA: 脆弱性分析和反复预防分析

脆弱性分析是风险评估的前提，与反复预防分析一起作为风险管理和未来发展的必要步骤，为经理和风险专家提供了有力的决策辅助工具。本课程旨在建立工业中基于欧盟目前最佳实践的脆弱性分析，并介绍脆弱性分析的基本知识。反复预防评估使投资更具有效性，本课程介绍了最新的方法和技术发展的最新阶段。

V-R38: HF: 新兴风险中的人为因素

本课程介绍了一种新方法—对于员工、作业场所和组织风险的心理方法。积极的工业风险—心理方法（IRP-PA）通过提高员工的表现和技术过程达到组织的成功。IRP 心理学家研究和识别了风险如何通过利用实践、培训程序和反馈系统改善行为和态度，同时帮助组织在发展和变革时期进行转变。

V-R39: DAA: 风险管理的决策辅助方法

决策是一个多重因素相互作用并形成最后决定的过程，这些因素可以是技术的、信息的、情感的 / 心理的、文化的等等。然而，经济管理者有限的理性使决策在越来越复杂的环境中更加艰难。安全管理需要对组织处理风险能力有很大影响的短期、中期和长期决策。

V-R40: KPI: 新技术关键业绩指标的概念和应用

本课程介绍了用于安全和风险评估的关键业绩指标（KPIs）的问题，尤其是与新技术关联的新兴风险的评估和管理。本课程详细介绍了 OECD, API, HSE/HSL, CCPS 和 VCI 等组织提出的主要概念，课程的第二部分讨论了这些概念的应用和相应的准则，同时介绍和讨论了这些应用的实践方面。

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Commencement Ceremony of the SafeChina project

The German-Chinese Cooperation in Training for SafeChina – Environmental Protection and Industrial Safety

January 12, 2013, Beijing

Beijing Municipal Institute of Labour Protection

Agenda

Emcee: Ms. Wang Tong, Vice director of BMILP

8:30 – 9:00 Registration

9:00 – 9:30 Welcome

9:00 – 9:10 Welcome address (Mr. Zhang Bin, General director of BMILP)

9:10 – 9:20 Welcome by DEG (Mr. Oliver Harms, DEG Country Director (China), Head of the DEG Beijing)

9:20 – 9:30 Welcome by Steinbeis (Mr. Aleksandar Jovanovic, Director of Steinbeis R-Tech & SafeChina Project Coordinator, On behalf of Prof. Dr. Dr. h.c. mult. Johann Löhn, President of Steinbeis University Berlin)

9:30 – 10:40 German-Chinese cooperation: SafeChina project and future activities

9:30 – 10:00 Presentation of the SafeChina project and its results
(Prof. Aleksandar Jovanovic)

Presentation of future activities based on SafeChina project
(Dr. Liu Yan, BMILP)

10:00 – 10:10 Speech (Mr. Zhang Dong, Officer from Dept. of Overseas Training, State Administration of Foreign Experts Affairs)

10:10 – 10:20 Speech (Mr. Chang Jiwen, Vice director of Beijing Administration of Work Safety)

10:20 – 10:30 Speech (Mr. Ding Hui, President of Beijing Academy of Science and Technology)

10:30 – 10:40 Speech (Mr. Bai Ran, Director of Dept. of International Cooperation, State of Administration of Work Safety officer)

10:40 – 11:05 Awarding the certificates

11:05 – 11:20 Short break

11:20 – 12:00 German-Chinese cooperation: Global context

11:20 – 11:40 Guest speech: Globalized Technical Change: Implications for Risk Governance, Knowledge Networks and Learning (Prof. Manuel Heitor, IRGC Portugal, former Secretary of State for Science, Technology and Higher Education in the Government of Portugal)

11:40 – 12:00 Guest speech: Educational Needs for Coping with Global Risks (Prof. Ortwin Renn, Member of the German Federal Government Ethics Committee on Energy Future)

12:00 Closing announcement (Ms. Wang Tong)

Beijing Municipal Institute of Labour Protection (BMILP)

Established in 1956 as a public interests research institute, Beijing Municipal Institute of Labour Protection (BMILP) that directly belongs to the People's Government of Beijing Municipality, is the first integrated scientific research institute proved by the State Council of the People's Republic of China to carry out the research on safety, environment and occupational health. Over the past 5 decades, BMILP has made great contributions in promoting the development of the labor protection in China.

After the development of more than half a century, BMILP has built 6 municipal-level professional research agencies and test centers in three important fields covering urban public safety, work safety and labor protection and human living environment. In the recent 10 years, BMILP has made more than 100 scientific research achievements, 80% of which are original or attain advanced level in China and 25% of which reach the international advanced level.

With its first-class research teams, 9 state-level, municipal-level high-tech centers and key laboratories, BMILP has gradually formed its characteristics and advantages in some important areas such as crowd risk prediction and early-warning, statistics analysis on work safety situation, occupational hazards testing, prevention and control, vibration isolation of subway, risk assessment in urban areas, etc..

BMILP has paid equal attention to cooperate with outstanding universities and research organizations and has established a long-term close cooperation relationship with Peking University, Tsinghua University, Chinese Academy of Sciences, Harvard University, Greenwich University and so on.



Steinbeis Advanced Risk Technologies Group (R-Tech)

Steinbeis Advanced Risk Technologies Group (R-Tech) is the cluster of units belonging to and/or linked to Steinbeis. Over 700 Steinbeis units present in 50+ countries worldwide act today as a global player in the area of innovation management and technology transfer. The group of Steinbeis units working in the area of "Advanced Risk Technologies" deals with multiple aspects of risks, risk engineering and risk management appearing, for instance, in:

- petro-chemical and process plants
- power plants and energy supply
- material technologies, especially advanced material technologies
- new & alternative technologies (CO₂, H₂, nano, ...).

Main aspects of risks dealt with are:

- risks in/of innovation (e.g. risks of unexpected side-effects)
- risk of non-performance or performance below expectations (e.g. risks of system or component failures)
- risk of adverse/unexpected effects and impacts (e.g. on public health and/or environment)
- risks over the life-cycle of products and technologies (e.g. unexpected problems in decommissioning or recycling phase)
- project risks, especially in innovation, R&D and new technologies oriented projects.

Organizing European and national stakeholders, promoting and supporting technology transfer, introducing new approaches to the risks and their management, developing specific methods and tools are examples of these activities.

R-Tech is also one of the five founding members of European Virtual Institute for Integrated Risk Management EU-VRI. The institute is an EEIG (European Economic Interest Grouping). The

group is capable to cover the above topics either on its own or in close co-operation with Steinbeis network, European Virtual Institute for Integrated Risk Management (EU-VRI), Virtual Institute of Knowledge-based Multifunctional Materials (KMM-VIN), European Technology Platform Industrial Safety (ETPIS) and other networks (all involving over 2,000 persons and over 500 companies).

The activities of the R-Tech group involve projects and activities on industrial, national, EU, and international level, tackling, e.g.:

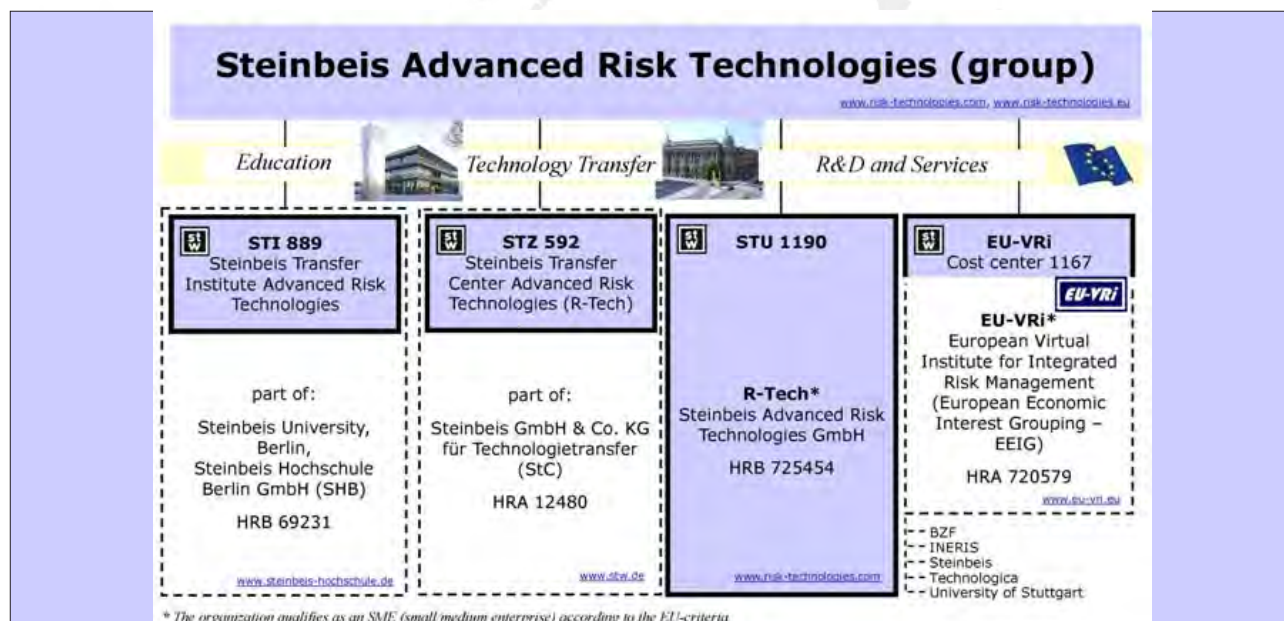
- integrated management of risk related to new technologies (FP7 project iNTeg-Risk)
- risks of impacts and/or non-performance of nanocontainer technologies, new bio-fuels in aerospace industry (Alfa-Bird), slurry coating technologies (FP7 projects MUST and Particoat), etc.

- governance and regulatory aspects of risks in industrial plants falling under the EU Seveso directive (EU project F-Seveso).

In order to provide the optimal service and results, the R-Tech group has dedicated units for specific area of "advanced risk technologies" such as:

- technology transfer
- education
- R&D
- industrial services ("business-oriented")
- EU-related issues

Large web-based system iRiS (Integrated Risk Management System) and its derivatives have been developed for the petroleum and power industries and have been applied worldwide. R-Tech supports ETPIS - European Technology Platform on Industrial Safety, coordinates activities in the area of emerging risk and has led the activity on standardizing the EU approach in the area of RBI (Risk Based Inspection), leading to the CEN WA document 15740.



SafeChina Project

Promoting the EU and German standards and practices of Environmental Protection and Industrial Safety in China



INTRODUCTION

SafeChina project aims to build a sustainable education service in China offering the engineers and relevant professions to learn about the EU HSE practices and regulation and qualify as Environmental and Safety engineers according to EU criteria, guidelines and practice. SafeChina project promotes the EU and German standards and practices of Environmental Protection and Industrial Safety in China. It is financed by DEG - Deutsche Investitions- und Entwicklungsgesellschaft mbH (the German investment and development agency) and realized by the Steinbeis University Berlin (SHB) represented by Steinbeis Transfer Institute Advanced Risk Technologies(R-Tech). Beijing Municipal Institute of Labor Protection (BMILP), as the main strategic partner of Steinbeis in China, is responsible for creating the educational structure and in charge of all the activities in China.

The core of SafeChina project is:

- Set of courses in the area of industrial Safety,
- HSE certifications scheme according to the EU requirements, and
- On-the-job training in EU/Germany.

A minimum of 10 different 5-days-courses will be offered, containing different focuses in the areas of environmental management, risk analysis, risk management. These courses shall be executed during the project period depending on the demand and will be combined with the on-job-training in Germany and possibly other EU countries. This educational concept combines theoretical education with on-the-job training, giving to the trainee opportunity to meet in practice implementation of some successful sets of measures for industrial risk management.

The target numbers in the whole project are:

- 200 students participated SafeChina training courses,
- 100 students received Steinbeis HSE (Health, Safety and Environment) certificates after passing successfully the final exams,
- 20 students participated one-week on-job-training in Germany companies while 3 students participated 4-week on-job-training in Germany companies,
- 5 students trained for SafeChina trainers,

- 20 students received certificates as HSE professionals after fulfilling the requirements of certification schemes.

RESULTS

SafeChina project started from Sept. 2010 and will end in Feb. 2013. After 2 years of implementation period, SafeChina project has created:

- A curriculum of courses in Risk Engineering and Management adapted to the needs of Chinese beneficiaries,
 - A pattern for on-the-job training in EU/Germany and
 - A certifications scheme for Chinese professionals.
- So far, the project has already achieved most of its goals, so far namely:

- performed a large-scale survey of Chinese needs in the area of industrial safety
- signed cooperation agreements with 20 Chinese partners
- signed cooperation agreements with INERIS, France and DEKRA, Germany
- prepared the curriculum of 12 full courses, fully translated in Chinese
- organized 14 instances of the above courses, attended by almost 500 participants
- certified more than 500 professionals (passed various levels of exams)
- had already 14 short and 3 long on-the-job-trainings for Chinese professionals in Germany
- qualified 16 Chinese trainers in the framework of the train-the-trainer measures
- incorporated courses from the project in the curricula of one of the Chinese top-class universities, CUEB
- negotiates incorporation of the courses into one of the Chinese top universities, Tsinghua
- negotiates incorporation of the courses into the professional education in Chinese companies (Sinopec, Ping An, etc.)
- prepares an independent German-Chinese joint venture ("Steinbeis Advanced Risk Technologies Beijing") which will continue project activities after the official DEG-project end, i.e. after February 2013.



Curriculum

Module I: Introduction - risks in industry

The module includes three compulsory courses, covering risk management principles and risk analysis techniques in different industrial plants. The emphasis is on topics such as EU directives on industrial safety, major accident prevention, risk assessment methodologies applied to petrochemical and power industries, as well as environmental and human health hazards. The courses encompass the theoretical basics for rules and regulations, risk identification and analysis methods, on the other hand numerous examples demonstrate the milestones and recent events concerning industrial safety and security.

I-R01 INTRO: Introduction to Risk Management

The course covers the main topics of industrial safety, starting with different aspects of risks and terminology used in the field. The main part of the course is dedicated to the related EU directives. The course outlines goals, scope and required measures / obligations considering acute (accidents) and chronic (pollution) risks. Special focus is given to major accident prevention and related process safety risk assessment methodology.

I-R02 PETRO: Risk Analysis in Petrochemical Industry

The petroleum industry is changing rapidly, challenging many organizations and individuals to keep pace and distinguish opportunity from risk. This course will present current global and regional issues in petrochemical industries. Topics include risk aspects and methods for hazard identification applied in petrochemical industries, probability and consequences analysis, risk assessment and safety and environment issues related to petrochemical industries.

I-R03 POWER: Risk Analysis in Power Industries

Knowledge of risk analysis applied specifically in power industry, starting with advantages and effectiveness of its application. It presents the regulatory basis and requirements, and elaborate commonly used methods through number of examples.

Module II: Asset/plant oriented risks management

Three optional compulsory courses compose the second module. The asset and plant oriented risk management firstly introduces principles of Risk Based Inspection in petrochemical and power generation industries dealing with the most important risk-based approaches in line with the main standard documents, such as API RP 580 and API 581. The courses about RBI offer a state-of-the-art knowledge on methods and tools applied. Second, the module discusses methodologies for decision-making processes in maintenance and accident prevention. These are well illustrated by a number of instances from different industries.

II-R04a RBI-PETRO: Risk Based Inspection - Petro

The course elaborates risk issues in petrochemical industries and explains principles of risk based inspection. It deals with existing risk-based approaches and gives links to applied codes and standards. The focus of the course is given to the main reference documents of American Petroleum Institute: Recommended Practice for Risk-Based Inspection (API RP 580) and Base Resource Document on RBI (API Publication 581) API 581.

II-R04b RBI-POWER: Risk Based Inspection - Power

The state-of-the art knowledge of risk based approaches currently applied in power generation industries to the wide range of professionals involved in different activities in conventional power generation.

II-R05 RCM&RCFA: Reliability Centered Maintenance and Root Cause Failure Analysis
Reliability Centered Maintenance (RCM) and Root Cause Failure Analysis (RCFA) as methodologies used for logical decision-making process for analysis and definition of the equipment maintenance requirements, as well as for accident prevention. The focus of the course is on the damage mechanisms appearing in different industries. A large number of well elaborated examples is included.

Module III: HSSE/Hazard oriented risks management

This module is dedicated to the hazard oriented risk management and includes 7 courses covering general introduction (topics on Health, Safety, Security and Environment and on Accident and Consequences Modeling) and specific issues (fire and explosion protection/modeling, risks related to the chemicals and transport of chemicals, as well as aspect related to the occupational safety and health) for single industry branches with focus on petrochemical and power industries.

III-R06 HSSE: Health, Safety, Security and Environment

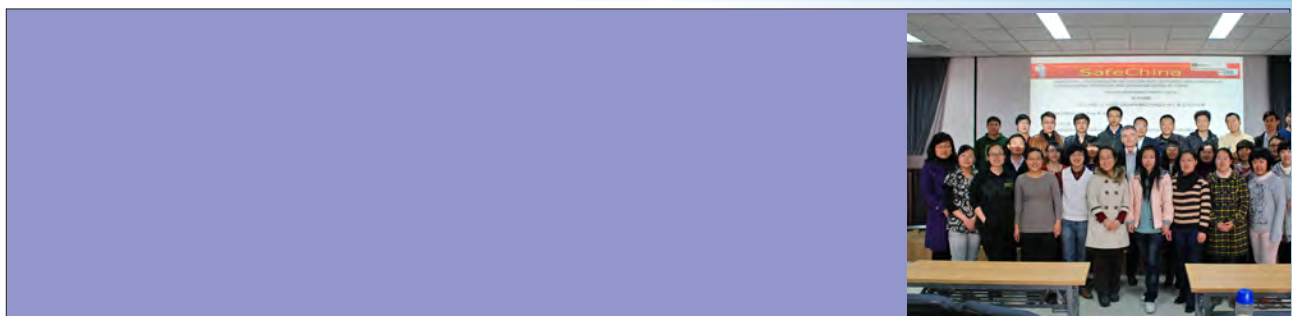
The course gives an overview of EU regulation in the field of HSSE (Health, Safety, Security and Environment), explains the objectives and requirements, as well as state-of-the art in the implementation including constraint and advantages. Special focus is: - on the integrated pollution prevention and control (IPPC) as defined in the new Industrial Emissions Directive (Directive 2010/75/EU) and the former IPPC directive (Directive 2008/1/EC), - on the prevention of major accidents (Directive 96/82/EC on the control of major-accident hazards - so-called Seveso II Directive).

III-R07 CoF: Accident and Consequences Modeling

General techniques for accident modeling and explains different models of explosion. It elaborates gas and vapor explosion, as well as gas dispersion modeling, using examples for applied methods. The course includes modeling of fire and presents current models.

III-R08 FIRE: Fire Protection

The course starts with the theory of fire and extinguishment, and thoroughly explains fire protection principles. Further, the course gives details related to the fire protection concepts including legal background and requirements with special focus on industrial fires and risk analysis. The course introduces basic principles and application of fire modeling, explains the phenomenon of a fire and gives an overview of the fire models and their hierarchy and discusses particular models, including numerical. The theoretical part is complemented with number of examples, including calculations, that illustrate the use of different fire models.



III-R09 ExP: Explosion Protection

EU directive ATEX which is presented in details, along with the principles of explosion prevention and protection adopted in this directive. Its practical application in the industrial plants is explained on a series of real life examples.

III-R10 REACH: Risk Analysis of Chemicals

Principles of the EU regulation in the area of registration, evaluation and authorization of chemicals – REACH (EC Nr. 1907/2006). The course explains principles and obligations for manufacturers, importers and downstream users to ensure that they manufacture, place on the market or use such substances that do not adversely affect human health or the environment.

III-R11 ADR: Transport of Dangerous Materials

International and EU policies and legislative requirements related to the transport of dangerous materials and explains the European Agreement concerning the International Carriage of Dangerous Goods. It elaborates the main issues from ADR 2009 as well as safety measures and procedures in case of accidents.

III-R12 OSHA: Occupational Safety and Health

The course aims to explain the EU regulations in the field of safety and health of workers at work. Main topics include general principles concerning the prevention of occupational risks, the protection of safety and health, the elimination of risk and accident factors, the informing, consultation, balanced participation in accordance with national laws and/or practices and training of workers and their representatives, as well as general guidelines for the implementation of these principles.

Module IV: Business/governance oriented risk management

This module includes topics such as Business continuity risks, Risk governance concepts, Corporate social responsibility and sustainability, Life cycle analysis and assessment, Emerging risks, Business communication and intercultural differences. It gives another insight to the risks issues and complements other modules devoted mostly to the technical and engineering issues of risk management in industrial plants (petrochemical plants, process industry, power plants etc).

IV-R13 BUSINESS: Business Continuity Risks & Insurance

Complement other courses devoted to technical and engineering issues of risk management in industrial plants (petrochemical plants, process industry, power plants, etc.). Technical risks in the above plants can be a cause or a contributing factor in/for the business continuity and the final outcome of the technical/engineering activities is practically always to be seen on the background of business implications and implications/impacts to the business activities of a company. The insurance aspects are the most relevant practical aspect linking the engineering and business side of the company operation and asset management: therefore these will be tackled, too.

IV-R14 iCSR&S: Integrated Corporate Social Responsibility and Sustainability

The course presents basic elements of the concept of Corporate (Social) Responsibility (CSR) and its practical application in industry. It starts with Key elements of the CSR, focuses on CSR methodologies and tools and on the technology related aspects as a part of the modern practices of industry (HSE, HSSE). Analysis/comparison of the practices in the EU, US and other countries and relevant data and information on best practices worldwide are elaborated, including a number of relevant case studies from the key industries and references to main sources of relevant data and information. A particular unit of the course is dedicated to new ISO 260000 standard.

IV-R15 RGOV: Risk Governance

Principles of modern risk governance including its main elements (ef. IRGC framework): a) pre-assessment, b) risk appraisal, c) risk characterization and evaluation d) risk management and e-risk communication. Apart from each of the elements (e.g. under "Risk Assessment": hazard identification and estimation, exposure and vulnerability assessment, risk estimation, exposure and social concerns, socio-economic impacts) the examples from industrial practice will be shown and explained. A separate part of the course will be dedicated to the overview of specific methods and techniques (e.g. Delphi), as well as to the tools and instruments facilitating the application by industry, governments and public bodies.

IV-R16 LCA: Life Cycle Analysis and Assessment

The course gives the participants opportunity to improve the knowledge about the Life Cycle Assessment (LCA) and to gain the skills to perform simplified LCA studies and to analyze, discuss and comment international scientific articles on LCA. The course will provide a comprehensive overview of the Life Cycle Assessment (LCA), Life Cycle Costing (LCC), International Reference Life Cycle Data System (ILCD) and European Reference Life Cycle Data System (ELCD). The focus will be on practical examples of applying LCA in industry and improving the environmental performance and sustainability of products and services.

IV-R17 EmRISK: Emerging Risks

The course introduces and transfers knowledge on emerging risks, and management of emerging risks. As "emerging" are considered primarily risks previously not recognized as risks, such as risks due to new processes, new technologies, new ways of working or social or organizational change (e.g. risks linked to nanotechnologies, bio-technology, new chemicals, outsourcing, globalization...). In addition the known risks emerging due to the change in public perception or new scientific knowledge are considered as well.

IV-R19 BC&M: Business Communication and Management of Intercultural Differences

In the times of ever increasing globalization, cultural differences and multilingual issues play an important role in the area of business communication which can easily fail on apparently banal issues. This could be of particular importance also in collaborative international projects.

The purpose of this course is exactly to assure that engineers, managers and IT experts can understand the importance of these aspects for the success of their collaboration with partners from other cultural background. In order to recognize, apprehend and manage cultural and international differences, a holistic and cognitive approach will be used throughout the training.

The course is open for any individual or Small- and Medium-sized Enterprise that is interested in the topic.

Module V: Elective/Additional topics

This module offers 15 elective courses with different subjects going into deep in some of the main topics of the courses in other modules. The courses give opportunity to review the basics and to extend the knowledge in certain specific areas important for a personal interest or professional career. This module also offers topics related to the emerging risk issues and current development of procedure, tools and methodology to deal with emerging risks related to the new technologies.

V-R21 S&RA: Safety and Reliability Analysis

This course presents the basic theory for safety and reliability analysis. The starting point is definition and discussion of basic concepts related to reliability and risk analysis. Then qualitative techniques like functional analysis, FMECA and identification and evaluation of faults and hazards are introduced. The next step is to introduce familiar quantification techniques like reliability block diagrams, fault- and event tree analysis, and Markov methods. Special attention is paid to safety-critical systems (IEC 61508) where analysis of systems with common cause failures is important. The course ends with methods for estimation of failure rates and a survey of reliability data sources.

V-R26 QRA&A: Quantitative Risk Assessment and Advanced Applications

The course presents an introduction to Quantitative Risk Analysis, thus illustrating the necessary steps for the calculation of risk indexes. Practical approach to frequency calculation and consequence assessment, including vulnerability models, will be discussed. A specific focus on domino effect and accidents triggered by Natural-Technological (Na-Tech) events will be presented.

V-R27 PubHealth: Public Health Oriented Risk Analysis

The course covers the main topics of health oriented risk analysis with different aspects of risks and terminology used in the field. The main part of the course is dedicated to the related actions used in overall analysis (assessment, perception, communication etc.). Furthermore, the course is illustrated by a number of examples, presents commonly used methods, in particular the issues like (1) Basics of Risk: Analysis, Assessment and Management, (2) Risk Analysis in Perspective (Measures of Risk), (3) Dose-Response Functions, (4) Risk Perception and Communication, (5) Variability and Uncertainty, (6) Cumulative Risk Assessment, (7) Risk Assessment, Management and Law and (8) Application to Public Health- WHO Methodology.

V-R28 RBIcon: API RBI Concepts in Industry

The focus of the course is given to the standard of American Petroleum Institute API 581 (API RECOMMENDED PRACTICE 581:2008 Risk-Based Inspection Technology) and its application in petrochemical industry. The course elaborates the basic concepts of API 581 and explains the principles of Risk Based Inspection.

V-R29 P&C: Probability and Consequence of Failure of Equipment

The focus of the course is given to the RBI approach to the inspection planning in petrochemical industry as defined by the standard of American Petroleum Institute API RECOMMENDED PRACTICE 581:2008 Risk-Based Inspection Technology (API 581).

The course provides quantitative procedures to establish an inspection program for pressurized fixed equipment by using risk-based methods. The procedure includes calculation of probability and consequence of failure, risk analysis and inspection planning based on the assessed risk. The pressurized fixed equipments covered by this course are pressure vessels, piping, tankage, pressure relief devices and heat exchanger tube bundles.

V-R30 CAA: Consequence Analysis in an API RBI Assessment

This course teaches how to calculate the consequence of failure as defined by API RP 581:2008 Risk-Based Inspection Technology. The course starts with general definitions aiming to ensure better understanding of the main topics of the course. Methodology for calculation is always illustrated with examples.

V-R31 BasicRIMAP: CWA 15740 RIMAP - The Basics

The focus of the course is given to the document, CWA (CEN Workshop Agreement) 15740: 2008, Risk-Based Inspection and Maintenance Procedures for European Industry (RIMAP). It aims to explain reasons to develop the European procedure, differences and advantages in comparison to API RBI methodology.

V-R32 ISO31000: ISO 31000 Principles and Management

The course covers in detail the International Standard of ISO 31000:2009 which is codified by the International Organization for Standardization (ISO). The course is dedicated to elaborate the relationship between the risk management principles, framework and process as described in this International Standard as well as touches on the standard's applicability in the industry.

V-R33 RBI PoF: RBI Probability of Failure - Damage Factors

The focus of the course is on the damage mechanisms appearing in different industries and their influence to the calculation of probability of failure of equipment. A large number of well elaborated examples are included.

V-R34 RP&C: Risk Perception and Risk Communication

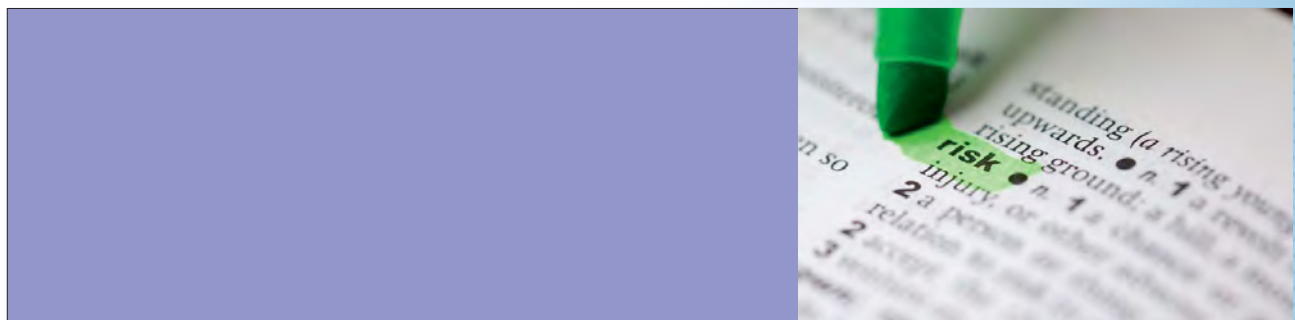
This course presents theoretical backgrounds and state-of-the-art research issues on perception and communication of risk. It aims to provide a solid basis for further developments of such work tasks by including theoretical achievements in the related fields, various examples from field work, and an internal training exercise. The understanding of communication processes and the improving of information and communication techniques related to risk and hazards are central themes of the course. The course will also provide insight into selected historical aspects as well as current topics and literature. Lecturing is complemented with exercises based on experience of focus group work.

V-R35 TRA: Transportation Risk Assessment

The aim of the course is the introduction to transportation risk analysis. The risk assessment of road, rail and pipeline transportation of hazardous substances will be illustrated. The approaches to frequency calculation, consequence assessment, and risk assessment will be discussed. Case studies will be carried out to illustrate the calculation and the use of individual, societal and other advanced risk indexes.

V-R36 IRM: Innovation Risk Management

The development of new products and technologies is a risky and uncertain process. The success of the new technology does not lie just in the invention part or in the generation of innovative ideas, but in the successful management of the innovation process from an idea to products and services in the market. The management of innovation is a rigorous process which includes a disciplined, stage-by-stage approval process combined with regular measurement of every critical factor, ranging from the capability of the product to reach the target characteristics to success in the market.



V-R37 VA&PA: Vulnerability Analysis and Return on Prevention Analysis

Vulnerability Analysis is a prerequisite to a risk assessment. Coupled with return on prevention analysis it could serve as an essential step in risk management and future scenarios development, giving managers and risk specialists a powerful decision assisting tool. This course aims to build up competences regarding vulnerability analysis in industry based on the current best practice in EU, as well as to provide basic knowledge regarding Return on Prevention Vulnerability analysis. Return on Prevention assessment gives the efficiency of the money and resources invested. The course presents the latest methodologies and instruments and also the latest stage of art.

V-R38 HF: Human factors in new and emerging risks

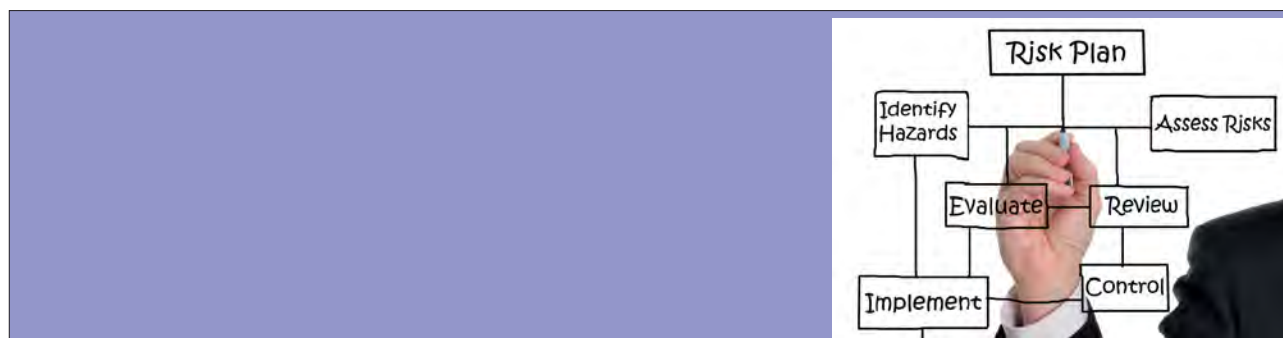
This course deals with a new approach – psychology approach to the employees, workplaces, and organization's risks. Industrial risks as positive – psychology approach (IRP-PA) contribute to an organization's success by improving the performance and well-being of its people and technological process. An IRP psychologist researches and identifies how risks can improve behaviors and attitudes by using risks through hiring practices, training programs, and feedback systems. IRP psychologists also help organizations transition among periods of change and development.

V-R39 DAA: Decision aid approaches for risk management

Decision making is a process where multiple factors interact to shape the final outcome. Those factors can be technical, informational, emotional/psychological, cultural... Nevertheless, the limited rationality of economic operators makes the decision exercise more and more difficult in a more and more complex world. Safety management requires short, mid and long term decisions that may highly influence the ability of the organization to cope with its risks.

V-R40 KPI: Concepts and Applications of Key Performance Indicators for New Technologies

The course addresses the issue of Key Performance Indicators (KPIs) as used in the safety and risk assessment, in particular for assessing and managing emerging risks linked to New Technologies. Main concepts developed by organizations like OECD, API, HSE/HSL, CCPS or VCI are presented in detail. Application of these and other concepts, as well as the corresponding guidelines, are discussed in the second part of the course, where also the practical aspects of these applications, including tools and practical views from industry on the use of indicators are presented and discussed.





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