Report

For the Intention of the Federal Ministry of Environment, Conservation and Reactor Safety and the Federal Agency of Environment of the Federal Republic of Germany

„Technology Transfer for Plant-related Water Protection in Moldavia, Romania and the Ukraine, Subproject 2, The Ukraine“

Orderer

Federal Agency of Environment, Berlin

Wörlitzer Platz 1

06844 Dessau

Promotion Number: 380 01 033

Contact partner:

Umwelt Bundes Amt

Umweltbundesamt
Referat III 1.2
Gerhard Winkelmann-Oei
Wörlitzer Platz. 1
06844 Dessau
Tel: +49 340 2103 3298
Fax: +49 340 2104 3298
mail: Gerhard.Winkelmann-Oei@uba.de

Projektleiter: Jörg Platkowski
Siemensstr. 2
37170 Uslar
Tel: +49-5571 - 3029090
Fax: +49-5571 - 913366
www.rdumweltschutz.de
mail: platkowski@rdumweltschutz.de

Final Report

Zuwendungsempfänger:	***Förderkennzeichen:***
R+D Ingenieurleistungen GmbH Siemensstr. 2 37170 Uslar	FKZ: 380 01 033
Vorhabensbezeichnung: Technologietransfer zum anlagenbezogenen Gewässerschutz in den Ländern Moldawien, Rumänien und Ukraine, Teilprojekt 2, Ukraine ***UBA/BMU - Förderschwerpunkt:*** Erhöhung des osteuropäischen Sicherheitsstandards im Bereich der anlagenbezogenen Gewässersicherheit	
Laufzeit des Vorhabens: 01.04.2002 bis 31.10.2006	

Berichts-Kennblatt

1. Berichtsnummer UBA-FB	2.	3.
4. Titel des Berichtes Technologietransfer zum anlagenbezogenen Gewässerschutz in den Ländern Moldawien, Rumänien und Ukraine, Teilprojekt 2, Ukraine		
5. Autor(en), Name(n), Vorname(n) Platkowski, Jörg Dr. v. Dincklage, Ralph		8. Abschlussdatum 31.10.2006
		9. Veröffentlichungsdatum: 2006
6. Durchführende Institution (Name, Anschrift) R+D Ingenieurleistungen GmbH Siemensstr. 2 37170 Uslar		10. UFOPLAN-Nr. 380 01 033
		11. Seitenzahl: 66
		12. Literaturangaben:
7. Fördernde Institution (Name, Anschrift) Umweltbundesamt Wörlitzer Platz 1 06844 Dessau		13. Tabellen und Diagramme: 1
		14. Abbildungen: 20
15. Zusätzliche Angaben		

16. Kurzfassung

Hintergrund des Projektes ist die Tatsache, dass das technologische und organisatorische Niveau der Anlagensicherheit in den osteuropäischen Ländern im Vergleich zu EU-Standards erhebliche Defizite aufweist. Solche Defizite haben in diesen Ländern bereits zu akuten Umweltschäden geführt bzw. bergen das Potential kurz- oder langfristiger, unmittelbarer Umweltgefährdungen.

Um diese Lücken in den osteuropäischen Sicherheitsstandards zu schließen, wurde das Projekt „Technologietransfer zum anlagenbezogenen Gewässerschutz in Rumänien, Moldawien und der Ukraine“ vom Bundesumweltministerium initiiert. Dieses Projekt zielt insbesondere auf eine Erhöhung des Sicherheitsstandards im Bereich der anlagenbezogenen Gewässersicherheit. Die fachliche und institutionelle Leitung des Vorhabens übernahm in Deutschland das Umweltbundesamt, in der Ukraine das Umweltministerium in enger Zusammenarbeit mit dem Regierungssekretariat.

Kernstück des Projektes war die Erarbeitung einer einfachen und übersichtlich strukturierten Methodik zur Gefahrenanalyse im Hinblick auf den Schutz von Grundwasser und Oberflächengewässern, angepasst an die ökonomischen und technologischen Möglichkeiten in den betreffenden Ländern. Basierend auf internationalen Empfehlungen, z.B. der Flussgebietskommissionen wurde eine so genannte „Checklistenmethode“ erarbeitet.

Um gemeinsam mit regionalen Vertretern aus Behörden und Industrie die Anwendung dieser Methode zu trainieren, wurden gefährliche Anlagen in den jeweiligen Schwerpunktgebieten Odessa, Transkarpatien und Dnepropetrowsk identifiziert, mit Hilfe der entwickelte Methodik geprüft und auf potentielle bzw. akute Gefährdungen analysiert. Zahlreiche fachliche länderübergreifende Diskussionen zwischen den lokalen Behördenvertretern, Mitarbeitern der zu prüfenden Betriebe sowie der ins Projekt eingebundenen nationalen Umweltschutzfirma Rizikon und den deutschen Vertretern aus Industrie und Behörden, führten zu einer kontinuierlichen Verbesserung der entwickelten Methodik.

Die im Projekt entwickelte Methodik führt systematisch und strukturiert durch die verschiedenen Aspekte der sicherheitstechnischen Prüfung und Bewertung gewässerschutzrelevanter Anlagen. Sie umfasst sowohl Checklisten bezüglich relevanter Funktionseinheiten wie z.B. Abdichtsystemen, Überfüllsicherungen, Umschlag wassergefährdender Stoffe, Sicherheit von Rohrleitungen, Abwasserteilströme, Lageranlagen und Ausrüstung von

Tanks als auch organisatorischer Konzepte für den Gesamtbetrieb wie z.B. Brandschutzkonzept, Aspekte der Zusammenlagerung, Anlagenüberwachung sowie betriebliche Alarm- und Gefahrenabwehrplanung. Stoffliche Gefahrenaspekte werden in der Checkliste „Wassergefährdende Stoffe“ erfasst und bewertet. Die spezifischen Anforderungen in Hochwassergebieten umfasst die Checkliste „Anforderungen an Anlagen in Hochwassergebieten“.

Defizite der mit dieser Methodik geprüften Anlagen werden weitestgehend lückenlos und objektiv erfasst. Auf der Basis der Defizite wurden Maßnahmenkataloge mit kurz-, mittel- und langfristigen Verbesserungsvorschlägen erarbeitet, die als Grundlage für eine Investitionsrahmenplanung dienen können. Vorrang haben hierbei einfache technologische und organisatorische „low cost“ Maßnahmen, die ohne unvertretbar hohen ökonomischen Aufwand zu einer erheblichen Erhöhung des Sicherheitsniveaus beitragen.

Um die Anwendung der entwickelten Checklistenmethode zu vereinheitlichen, wurde ein Handlungsleitfaden entwickelt, der sowohl anforderungstechnische Details als auch praktische Leitlinien zur Vorgehensweise bei der sicherheitstechnischen Prüfung und Bewertung der Anlagen mit wassergefährdenden Stoffen enthält.

In den drei durchgeführten Schulungs- und Trainingsmaßnahmen wurde einem breiten Kreis lokaler und regionaler Inspektoren, die entwickelte Checklisten-Methodik zur Anlagenbewertung und -prüfung vorgestellt und deren praktische Anwendung demonstriert. Mit der Nutzung der Checklisten durch die geschulten Inspektoren kann die Effektivität und die Vergleichbarkeit der sicherheitstechnischen Prüfungen erhöht werden. Das ist Grundlage für eine Verbesserung des Standes der Anlagensicherheit in Hinblick auf den Schutz der Gewässer. Von den Teilnehmern wurde die Methode als Hilfsmittel zur Erfüllung zahlreicher nationaler und internationaler Vorschriften anerkannt.

Zur Schulung der Methodik einer komplexen, nicht nur auf Wassergefährdungen basierenden Sicherheitsanalyse wurde beispielhaft ein Muster-Sicherheitsbericht auf Basis der Seveso-II-Richtlinie der EU anhand einer konkreten Musteranlage erarbeitet.

Sicherheitslücken in Anlagen mit wassergefährdenden Stoffen stellen oft nicht nur eine nationale, sondern auch eine länderübergreifende Gefährdung dar. Um eine effektive und schnelle länderübergreifende Alarmierung und Gefahrenabwehr analog zu EU-Standards zu gewährleisten, wurde unter Einbeziehung regionaler Behörden ein grenzüberschreitender überbetrieblicher Notfallplan anhand einer konkreten Anlage erarbeitet. Dieser Gefahrenabwehrplan dient als Fallbeispiel für eine länderübergreifende Notfallorganisation und ist vom Aufbau und Systematik auf andere Regionen und Unternehmen übertragbar.

Ein weiteres wesentliches Ergebnis dieses Projektes ist eine Empfehlung für eine Verordnung zum Schutz von Grund- und Oberflächengewässern insbesondere für die Ukraine. Auf dieser regelungstechnischen Grundlage kann zukünftig das staatliche Verwaltungshandeln hinsichtlich des anlagenbezogenen Gewässerschutz bei gefährlichen Industriebetrieben koordiniert und konkretisiert werden.

Unverzichtbar für den Projekterfolg war eine breite und vielfältige Kommunikation der Projektinhalte und Projektergebnisse. Hierfür dienten eine Reihe von Seminaren, Beratungen und Schulungen, aber auch Präsentationen im Internet (http://www.umweltbundesamt.de/anlagen/index.html bzw. www.rdumweltschutz.de), auf Flyern sowie Beiträge in der Presse. Durch Teilnahme an verschiedenen internationalen Tagungen konnten die im Projekt gesammelten Erfahrungen an andere Projektgruppen und internationale Kommissionen weitergegeben werden.

17. Schlagwörter

Anlagenbezogener Gewässerschutz, Erhöhung der Anlagensicherheit, Systematische und strukturierte Prüfung und Bewertung gewässerschutzrelevanter Anlagen, Checklistenmethode, Störfallvorsorge, internationale Anforderungen, internationale Zusammenarbeit, Seveso II Direktive und andere.

18. Preis:	19.	20.

Berichts-Kennblatt (russisch)

1. Доклад №: UBA-FB	2.	3.
4. Заголовок доклада: Трансферт технологий защиты водоёмов от воздействия промышленных объектов в Республике Молдова, Румынии и Украине, 2 часть проекта, Украина		
5. Автор(ы), фамилия, имя: Платковский, Йорг Доктор Ральф фон Динклаге		8. Дата окончания работы: 31.10.2006 г. 9. Дата публикации: 2006 г.
6. Организация исполнитель (Название, адрес): R+D Ingenieurleistungen GmbH Siemensstr. 2 37170 Uslar		10. UFOPLAN-Nr. 380 01 033 11. Число страниц: 66 12. Использованная литература:
7. Финансирующая организация (Название, адрес): Umweltbundesamt, Wörlitzer Platz 1, 06844 Dessau / Федеральное Агенство окружающей среды Германии Вёрлитцер платц 1, 06844 Дессау		13. Таблицы и диаграммы: 1 14. Иллюстрации: 20
15. Дополнительные данные:		

16. Краткое содержание, абстракт:

Причиной инициации проекта стал тот факт, что технологический и организационный уровень безопасности промышленных объектов в восточно-европейских странах существенно отстает от стандартов ЕС. Это отставание уже привело в этих странах к значительному ущербу окружающей среде и увеличению потенциала краткосрочного и долгосрочного негативного воздействия на окружающую среду.

Чтобы устранить пробелы в области стандартов безопасности в этих странах Федеральным Министерством окружающей среды был инициирован проект «Трансферт технологий по защите водоёмов от воздействия промышленных аварий в Румынии, Молдове и Украине». Этот проект, прежде всего, нацелен на повышение стандартов безопасности на объектах, потенциально опасных для водной среды. Общее руководство проектом в Германии взяло на себя Федеральное экологическое ведомство, в Украине – Министерство окружающей среды в тесном сотрудничестве с секретариатом правительства.

Центральной задачей проекта стала разработка простой в обращении и четко структурированной методики анализа рисков для грунтовых и поверхностных вод, приспособленной к технологическим и экономическим условиям в соответствующих странах. На базе рекомендаций международных речных комиссий был разработан так называемый метод Контрольных списков (КС).

Для того чтобы совместно с представителями органов власти и промышленности опробовать этот метод, в Одесской области, Закарпатье и Днепропетровске была поведена инвентаризация объектов повышенной опасности, некоторые из которых были обследованы с помощью этой методики на предмет потенциальных и актуальных рисков. Многочисленные профессиональные дискуссии в процессе реализации этого межгосударственного проекта, в которых участвовали представители местных властей, сотрудники инспектируемых предприятий, национального координатора проекта – фирмы RIZIKON, а также представителей немецкой промышленности и органов власти, обеспечили возможность постоянного совершенствования КС.

Методика, разработанная в ходе работы над проектом, позволяет системно и структурировано подходить к оценке различных аспектов технической безопасности объектов, потенциально опасных для водной среды. Она охватывает как релевантные функциональные узлы, например: системы герметизации, устройства, предохраняющие от переполнения, перегрузка опасных для воды веществ, безопасность трубопроводов, отдельные потоки сточных вод, складские помещения, оснащение ёмкостей; так и концепции безопасности для всего объекта, как то: концепция пожарной безопасности, аспекты совместного хранения, контроля установок, внутризаводской план предупреждения и оповещения об

опасности. В КС „Вещества, опасные для воды“ дан перечень опасных веществ, классифицированных по степени опасности для водной среды.

Специфические требования, предъявляемые к территориям возможного затопления, содержит КС „ Требования к объектам, расположенным в паводковых зонах“.

Недостатки объектов, обследуемых с помощью этой методики, выявляются объективно и без пробелов. Анализ недостатков позволяет разработать предложения по краткосрочным, среднесрочным и долгосрочным мерам по их устранению, которые служат основой для планирования инвестиций. Преимущество при этом отдается простым технологическим и организационным мероприятиям, которые без больших затрат позволят существенно повысить уровень безопасности на предприятии.

Чтобы сделать разработанный метод общедоступным был определен единый подход к его применению, который учитывает как технические детали, так и практическое применение КС при обследовании потенциально опасных для воды объектов.

На 3-х проведенных семинарах-тренингах широкому кругу местных ирегиональных инспекторов была представлена методика КС и продемонстрировано её практическое применение. Применяя КС, эксперты могут повысить эффективность инспекций технической безопасности объектов и сравнить этот метод с теми, которые они используют в своей деятельности. Это является основой повышения безопасности объектов, потенциально опасных для водной среды.

Инспекторами данный метод был признан одним из средств практической реализации многих национальных и международных предписаний.

Для лучшего овладения методом, как универсального средства подхода к проблемам не только водной, но и окружающей среды в целом, был разработан образец отчета по безопасности на основе директив СЕВЕЗО и ЕС и на примере конкретного предприятия.

Пробелы технической безопасности объектов, потенциально опасных для водной среды, часто представляют собой проблему не только национального, но и межгосударственного уровня. Для быстрого и эффективного информирования компетентных органов других государств о возникновении чрезвычайной ситуации, аналогично тому, как это делается в странах ЕС, был при участии представителей региональных ведомств разработан межгосударственный внешний план действий в аварийных ситуациях. При этом в качестве образца использовался конкретный аналог. Этот план является руководством к действию одной из межгосударственных служб реагирования на чрезвычайные ситуации и по своему содержанию и структуре является универсальным.

Другой и очень существенный результат проекта, касающийся непосредственно Украины, – это предложение по принятию Постановления «О защите грунтовых и поверхностных вод». Опираясь на этот нормативный акт, государственные органы смогут в дальнейшем лучше координировать свою деятельность в области надзора за потенциально опасными объектами.

Неотъемлемой частью проекта стала широкая пропаганда целей, задач и результатов проекта. Этой цели служили семинары, встречи, учения и, не в последнюю очередь презентации в Интернете (http://www.umweltbundesamt.de/anlagen/index.html и www.rdumweltschutz.de) и публикации в прессе. Благодаря участию в различных международных мероприятиях мы смогли поделиться опытом, накопленным в ходе реализации проекта.

17. Ключевые слова:

Защита водоёмов от промышленного воздействия, повышения уровня промышленной безопасности, систематическая и структурированная проверка и оценка потенциально опасных для водоёмов промышленных объектов, методика Контрольных списков, предупреждение аварий, международные требования, международное сотрудничество, директива Севезо II и другие.

18. Стоимость:	19.	20.

Berichts-Kennblatt (English)

1. Report No: UBA-FB	2.	3.
4. Reports Title: Technology Transfer for Plant-related Water Protection in Moldavia, Romania and the Ukraine, Subproject 2, The Ukraine		
5. Author(s), Family Name(s), First Name(s): Platkowski, Jörg Dr. v. Dincklage, Ralph		8. Report Date: 31.10.2006 9. Publication Date: 2006
6. Performing Organisation (Name, Address): R+D Ingenieurleistungen GmbH Siemensstr. 2 37170 Uslar		10. UFOPLAN-Nr. 380 01 033 11. No. of Pages: 66 12. No. of References:
7. Sponsoring Agensy (Name, Address): Umweltbundesamt Wörlitzer Platz 1 06844 Dessau		13. No. of Tables, Diagrams: 1 14. No. of Figures: 20
15. Supplementary Notes:		

16. Abstract:

Background of the project was the fact that the technological and organisational level of plant safety in East European countries is not as developed as the EU-standards require it. These deficits have already lead to major environmental accidents or they could lead to short or long term natural disasters, in these countries.

To remove the lacks in the safety standards of the East European countries, we initiated the project “Technology Transfer for Plant-Related Water Protection in Romania, Moldavia and the Ukraine“. The main target of this project is to increase the safety standard in the field of plant-related water protection. The professional and institutional management of the project has been taken over, in Germany by the Federal Environment Agency and in the Ukraine by the Ministry of Environment, in cooperation with the Government Office.

The principal item of the project was the elaboration of a simple and clearly structured method for water analysis, in view of the safety of ground and surface water, adapting to the economical and technological possibilities in the participating countries. Based on international recommendations, e.g. the Joint River Bodies, we elaborated the so called Checklist Method.

To train the implementation of this method together with the regional representatives from authorities and industry, plants in the regions Odessa, Transcarpatia and Dnepropetrowsk have been identified, examined with the checklist method and analysed on potential or acute risks.

The numerous discussions between the local authorities, the representatives from the plants that were analysed and the leaders of the national environment protection company Rizikon, have helped us continuously improve and develop further the checklist method.

The checklist method is a big help for the systematic and structured plant check, with various aspects of the safety related examination and evaluation of water protection related plants.

The method contains both checklist for relevant plant units, like sealing systems, over-fill safety, transhipment of substances hazardous to water, pipeline safety, waste water streams, storage facilities and equipment of tanks and organisational concepts for the whole plant, like fire fight concept, aspects for the joint storage, plant monitoring, as well as plant alert and risk precaution planning. The risk aspects of substances are being evaluated in

the Checklist „Substances Hazardous to Water“, the specific requirements for flood endangered areas will be found in the checklist “Requirements for plants in flood risk areas”.

The deficits of the checked plants are perceived objectively and without lacks. On the basis of these deficits, we elaborated measure catalogues, with short, mid and long-term measures for the improvement of the safety level of the plants. The so called “low cost” measures for increasing the safety level are privileged.

To unify the application of the checklist method, we elaborated an action guide, which contains both requirement details and practical guidelines for the strategy of examinating and evaluating of plants handling substances hazardous to water.

During the 3 performed trainings, the checklist method has been presented to a big number of local and regional inspectors. The effectiveness and the comparability of the safety examinations, by the local inspectors, can be increased thanks to the checklists.

The participants saw this method as an aid for the implementation of many national and international regulations.

During the training, the participants also learned how elaborate a sample safety report, according to the Seveso-II-Guideline of the EU, based of the inspection of a sample plant.

Safety lacks in plants handling substances hazardous to water, usually do not represent only a national, but a supra national danger. To assure an effective and fast alerting and to guarantee a high protection, according to the EU standards, a cross-border emergency plan has been elaborated, with the cooperation of the regional authorities and using a real plant, as an example. This emergency plan is a case sample for a supra national emergency organisation and can be transmitted to other plants.

Another relevant result of the project is a recommendation for the regulation for the protection of ground and surface water, especially for the Ukraine.

Indispensable for the success of the project was a varied communication of the project’s contents and results. A number of seminars, consultations and trainings, as well as internet presentations (http://www.umweltbundesamt.de/anlagen/index.html or www.rdumweltschutz.de), flyers, articles in the media have helped this matter. By participating at various international meetings, the project, together with the gained experience, could be presented to other international commissions.

.

17. Keywords:

Plant related water protection, Improvement of installations safety, systematic and structured plant check, Checklists, Hazard prevention, international requirements, international cooperation, Seveso II Directive

18. Price:	19.	20.

1 Table of Contents

D-37170 USLAR
FON: 05571/ 3029090
FAX: 05571/ 913366
EMAIL: PLATKOWSKI@RDUMWELTSCHUTZ.DE

2 Pictures

3 Tables

Appendix:

Appendix 1: Checklists 00 - 14

Appendix 2: Action manual to handling the check lists

Appendix 3: Documentation of the plant checks

Appendix 4: Documentation of the seminars and workshops from 2002 to 2004

Appendix 5: Documentation of the training measures Application of the Checklists method for checking and assessing the technical safety of industrial plant with relevance to water pollution control

Appendix 6: Recommendation of a regulation regarding the protection of groundwater and surface waters on the basis of plants with water-dangerous materials

Appendix 7: trans-border inter-plant emergency scheme

Appendix 8: Sample safety report

Appendix 9: Presentations for the training measures

Appendix 10: Publications, Newsletter, page for the internet

4 Preliminary Remark

This is the final report for the project „Technology Transfer for Plant-related Water Protection in Moldavia, Romania and the Ukraine, Subproject 2, The Ukraine“. It also contains a description of the order of events, the discussion points and results of the project powered by the Federal Ministry of Environment, Conservation and Reactor Safety.

Together with the report goes a CD, which contains all the documents mentioned here. These documents are not delivered as printing friendly versions, but can be offered as such, on demand.

5 Target, Purpose and Task Formulation

As known from earlier projects, East-European countries have a lower safety level. This project's aim, together with other projects powered by the Federal Ministry of Environment, Conservation and Reactor Safety, is to increase the safety level in these countries, in this case the Ukraine, adapting them, in medium term, to the level of the EU-member states.

Target of this project is to adapt the plant safety level, especially with regards to the water protection, in the Ukraine, to the Central European standard.

For that purpose, plants handling dangerous and water endangering substances and dangerous waste waters have been identified in the Ukraine. Thru these examples, the level of plant safety, in view of the water protection, should be improved. The three rivers, Dnepr, Dnestr and Theiss are the main points of these activities.

An essential task was the intermediation and the training of a complex safety management team, in view of substances hazardous to water. This means that a method for plant examinations, which also contains suggestions for measures to be taken in case of need, had to be elaborated and presented. The project also includes the method of elaborating a safety report and of a cross-functional emergency plan.

6 Background

The project was implemented within the scope of the Federal Government's Consultation Help Program: „Technology Transfer for Plant-Related Water Protection in Romania, Moldavia und the Ukraine“.

The first phase of the project, in Romania and Moldavia, delivered first practical experience for the methodological check of a plant handling substances hazardous to water, on the East-European level, experiences on which could be worked on.

During these first projects, R+D worked on partial issues in the development area and testing of an evaluation method and the so won experience, which could be applied within the new project.

It is indisputably that the industrial activity can causes huge water damages. A new example for this was the accident in Baia Mare (Romania), where 100 000 cubic meters of cyanide polluted water escaped from a mining company into the Danube via its tributaries, the River Somes

and the River Theiss. Also other accidents, like the one in Sandoz, more than 10 years ago, are not forgotten.

The current project is concentrating on bigger plants, which typically show big amounts of substances, as they are presented in Column 3 of Appendix I of the Seveso Guidelines (complies with Column 5 of Appendix I for Accident V). With an example calculus[1] even small amounts of leakages, which can cause water polluting accidents, can be detected.

This project's aim is to work out a suitable method for examinating water plants, especially in the Ukraine.

By means of exemplary plant checks, by local authorities from the Ukraine and from Germany, together with experts from the industry, the appreciation of the problem and the method for checking the level of plant-related water protection in the Ukraine was to be improved and trained.

7 Water protection laws in the Ukraine

The following laws are enacted in the Ukraine:

- 22.12.04, Ukrainian law for „Handling Industrial Explosive“
- 20.11.02, Ukrainian law for „Safety at Work“
- 17.01.01, Ukrainian law for „Risk Plants, which may represent a danger for the environment“
- 31.05.00, Ukrainian law for „Licensing certain industrial areas or activities“
- 05.10.99, Ukrainian law for „Mining safety“ (Mining Law)
- 16.12.93, Ukrainian law for „Fire Protection“

To this we add the following regulations:

- Government regulation, from August 14, 2006, No. 1195 – “Reorganisation of the national department of industrial plant safety, safety of work and mining”
- Nov. 14, 2005 - „Appointment for national mining supervision“
- March 25, 2004. „Realisation order of the supervision, examination and expertise (technical supervision) of machines, gears and plants, which may cause a danger for the environment“
- Nov. 25, 2003 - „Supervision order in the area of national liability insurance“
- Oct. 14, 2003 - „Authorisation issuing order, by the national committee for safety of work and its regional departments“
- July 05,2006 - „Recommendations for an efficient system in the area of work safety”
- Jan. 31, 2006 - „Directory of accredited industrial explosives“
- Dec. 07, 2005 - „National registry of legitimate-normative documents in the area of safety of work”

[1] An accident evaluation value for substances hazardous to water of the WRC 2..3 with ≤5 mg/l for the substance „water“ is assumed as ad-hoc basis. This value is meant to impact on the substance for 10 hrs. ; cp. with appendix 4, no. 4.3 of the Administrative Fiat for Substances Hazardous to Water.

The previous accident evaluation value, for a channel flow of e,g. 10,000 $m^3/h \approx 3\ m^3/s$, a water leakage rate of 15 g/s, would be sufficient for an accidental event.

And if we also take into account that, according to the safety engineering in Germany (heading Technical Regulations for Substances hazardous to water, „Overground pipelines“), pipelines with a pipe diameter of 50 mm, can show a leakage rate of 30 g/s, double as high as allowed, it becomes clear that in the host countries major risks exist (also of the B category “Major events and accidents”).

Ukrainian law for „Risk Plants, which may represent a danger for the environment“

This law assigns the legal, economical, social and organisational basics of the activity of the industrial plants, potentially harmful for the environment. It is targeted on the life and health protection of the humans, as well as on the environment protection against dangerous accidental effects and on their prevention, localization and elimination.

Column 1. *Definition of Technical Terms*

Risk plants are those plants in which one or more dangerous substances, in normative-limit value amounts, are being used, produced, processed, stored or transported. To this also belong plants which, according to the law, represent an instant risk for the occurrence of an extraordinary industrial or natural based event.

The dangerous substances are chemical or toxic ones, as well as explosives, oxidants, fuels, or biological substances that can be dangerous for the health or the life of humans and whose condition can be harmful for the health and life of humans, the environment or for other material goods.

Potentially harmful plants are those which use, produce, process or transport dangerous, biological or other kind of substances, which could represent a real risk, under certain circumstances.

An industrial accident is a dangerous event, as a result of improper use of the operating, potentially harmful plants (limit value output of pollutants, fire outbreak, explosion, etc.), which causes instant or indirect, negative consequences for humans and the environment.

Over the limit damages are those accidents caused by a dangerous substance, which exceeds the national territory.

Risk management is the process of taking actions and implementing measures to minimize the potential risks that may occur.

The safety declaration is a document that describes the measures to be taken, for preventing and locating, as well as eliminating the effects of an accident.

Column 3. *The State Supervision on Risk Plants*

Guidelines:

- Warranting ecological safety and a suitable nature protection;
- Protection the population and its habitat against industrial accidents and calamities of nature;
- Fire protection;
- Sanitary-epidemiological Safety;
- Safety of work.

Column 9 *Determination of Risk Plants*

Column 10 *Safety Declaration*

Column 11 *Danger Defence Planning for Risk Plants*

- For a fast reaction after an industrial accident or a natural calamity, every operating unit of a plant should have its own safety declaration, containing the localization and removal of the accident effects.
- If the effects of the industrial accident exceed the limit values, the national authorities should be informed.

Column 15. *Granting Information about Risk Plants and the Right for Information Exchange*

- According to column 3 of the law, the leader of the plant is committed to give out information about the risk factors of the plant, to the regional administration departments of executive authorities, the local authorities and the media.
- An artificial or natural person is allowed to collect information about the risk plant or its risk units and pass it on, to the executive authorities, the media or other interested persons, if the data about the improper operating of the risk plants can lead to dangerous effects for the humans or the surrounding environment.

Column 18. *International Cooperation*

- The Ukraine participates in the international cooperation, in the area of prevention of industrial accidents, their localization and removal of negative effects for the humans and the environment, for the purpose of safe operating of risk plants.
- If the ratified international agreements of the Ukrainian parliament contain different norms than the ones included in this law, the rules of international agreements have priority.

7.1 Water Code of Law of the Ukraine

- The waters in the Ukraine (water objects) represent an opulence of the Ukrainian people, a natural basis of the country’s economical and social development.
- The water resources are the existential basis for humans, animals and plants, they are degradable and can be easily damaged.
- Thru the increasing environmental pollution, due to human activity and the development of production, the need for compiling and following special rules for the rational use of water supplies and its ecological protection, is born.
- The Water Code of Law of the Ukraine supports, auxiliary to other organisational, legal and economical measures, the development of an ecological water legal order, the protection of the inhabitants and the environment, as well as the efficient use of water supplies and controls its degradation.

Chapter 20. *Protection of Water Supplies against Contaminations and Degradation*

Column 95 Water *Protection*

All waters are protected against contaminations and degradation, as well as against other water harming actions, which could disturb the water supplying, harm the health of humans, reduce the fish stocks, impair the existence conditions of wild animals, reduce the ground fertility. The

protection also goes against other negative effects that may occur as a result of physical or chemical changes of the water, its loss of quality or hydrological and hydrogeological changes.

Column 101 *Water protection against contaminations, due to the discharge of lubricant oils, fuels and chemical substances, crude oil and other pollutants*

Column 103 *Prevention of the water pollution due to fertilizers and chemical pesticides*

Paragraph VI. *International Relations*

Chapter 24. *International Agreements*

Column 112. *Application of International Agreements.*

If an international agreement, on which the Ukraine takes part, includes other rules than the ones provided in the Water Code of Law of the Ukraine, the international rules will be used with priority.

7.2 Regulation of the Ministry for Extraordinary Situations of the Ukraine, June 27, 2006, No. 398

4.1.2 Safety of Work Policy

- The leader has to determine and record the safety of work policy.
- This policy becomes an organic component of the whole production.
- The regulation of the main directions of this policy is to be made on the basis of a complex evaluation of the security level of single plant units, evaluation which is made by the investigation of all dangerous and damaging agents of production, on single plant units, as well as by analysing the origins of accidents.

4.3.4. Ongoing inspection rounds, surveillance of single plant units and of the entire plant

The surveillance system may imply following different test methods, depending on the production volume and number of employees:

- administrative-public control (internal audit),
- steady inspection rounds by plant management representatives,
- controls by the safety at work service and the commission for safety at work.

During an internal audit, fields of competence and strategies are being determined and documented, for solving tasks such as:

- determination of important functional units, which need special attention during check ups, compiling a questionnaire for each functional unit;
- Penning expertise protocols with the predefined time limit;
- Predefining measures for the correction of the deffects by
- Including the co-workers of the plant and the working-teams.

8 Project Structure

The project sequence is being determined by the following steps:

1 Approaching and project coordination with the national authorities
2 Choosing the accident relevant plants
3 Performing plant checks in the chosen plants, using the checklists
4 Evaluating the plant checks
5 Compiling suggestions for the long-term consolidation of the safety level
6 Analysing all results, to identify a branch-overtaking improving potential
7 Authoring a safety report
8 Compiling a cross-border emergency plans for different plants, by including the local authorities
9 Developing safety guidelines for the surveillance and the developement of the policy
10 Contact intermediation with German companies
11 Training of local experts
12 Preparing and implementing international seminars on the project's subject
13 Presenting the result at international conferences
14 Elaborating online and other kind of presentations to support the international projects results exchange

9 Approaching and Project Coordination with the National Representatives

Target of this project step: The participants in the hosting country should be known personally and by their names, for creating a better work atmosphere, during the project. Additionally, authorities, providers and non-governmental organisations have to be recorded. The target and the order of events of the project have to be discussed and put in concrete terms.

R+D has already worked on such a project before, with the main actions being taken in Romania. During this work, relations to decision-makers in this region have been established.

For a positive trade it was important to identify the local stakeholders and to establish a common work basis. The project's target and steps have been communicated and voted during this project step.

Previous to the approaching and attuning of the activities with the Ministry of Environment of the Ukraine and the regional representatives who were involved in this project, several consultations in Kiev and the corresponding partner regions have taken place.

Thru these meeting, the following time table, as well as the following focus regions have been determined:

1. Plant checks and seminars in the region Odessa were to be performed over the year 2002. The highlight here was the raising of the safety level in the area of the river Dnestr and the Black Sea.
2. Plant checks and seminars in the Transcarpatian region (the river Theiss) and elaboration of the cross-functional emergency plan in the border region Moldavia-Ukraine (the river Dnestr), were to be performed over the year 2003.
3. Over the year 2004, plant checks and seminars in the region of Dnepropetrowsk were planned. The highlight here was the elaboration of a safety report, as well.

The German company R+D Industrie Consult and the Ukrainian company RIZIKON had charge of the good realisation of this project.

Several other Ukrainian, German and international organisations, authorities and companies have done their part for the successful ending of this project, by helping with solving partial issues.

With the support and the cooperation with the Ukrainian Ministry of Environment, the responsible authorities and the Ukrainian experts, all the aims of the project have been achieved in time and in high quality.

Results of this step of the project: Elaboration of name and address lists of the participants, with skill specifications. You can find this document under /Adressen/Adressen.xls. Elaboration of an detailed project plan with concretely defined job steps and the project's accomplishments.

10 Choosing the Plants

Target of this step of the project: was choosing the plant and concluding the contract with representatives from each 3 plants in the chosen region for performing plant checks there and choosing a plant with the need of compilation of a cross-functional emergency plan and a plant for the exemplary elaboration of a safety report.

The selection of the plants was guided by

- The accident relevancy (substance inventory as per Seveso-II-Guideline)
- The inclusion in the Catalogue of the IVU Guideline
- The amendment suggestions of the Seveso-II-Guideline (cf. Federal Council printed matter 20/02)
- The inclusion in the „List of Activities“ of the UN ECE[2]
- The situation of the waters (hinterland of the previously named rivers Dnjepr, Dnjestr, Donau)
- The country typical details (size of the company, age, financial and management structure)

For a successful project execution, other organisational aspects have to be taken into account, additionally:

- Motivation of the administrative management and the other participants
- Readiness for an open information exchange about the results

The selection was coordinated with the orderer of the project and especially followed the wishes of the regional contacts and participants in the hosting country.

The selection included:

- 9 plants for performing plant checks, especially:
  - One plant for storage and transhipment of oily substances (incl. harbours)
  - One plant for storage and transhipment of mineral oil products
  - One plant for water purification
  - One forest chemistry plant

[2] The Ukraine, Romania and Moldavia are contract parties.

  - One natural gas compressing station
  - One plant for cardboard production
  - One plant for motor vehicle tyre production
  - One plant for metal products
  - One plant for nitric acid products
- One company for the elaboration of am exemplary emergency plan (sewage rehashing installation)
- One company for the elaboration of a sample safety report (plant for nitric acid production)

During this step of the project, some unexpected difficulties occurred. Plants who have previously agreed on a cooperation, have rejected us on the day of the sightseeing. Also, during introductional conversations with one of the selected plants, it turned out that the stored amount of substances didn't exceed the allowed limit of the SEVESO-Guideline and so the plant doesn't need a safety report. A new plant that meets the requirements had to be found shortly. Thanks to the great support of the local authorities, these problems could be solved shortly, so that the success of the project wasn't endangered.

11 Performing Plant Checks based on the Checklist Method

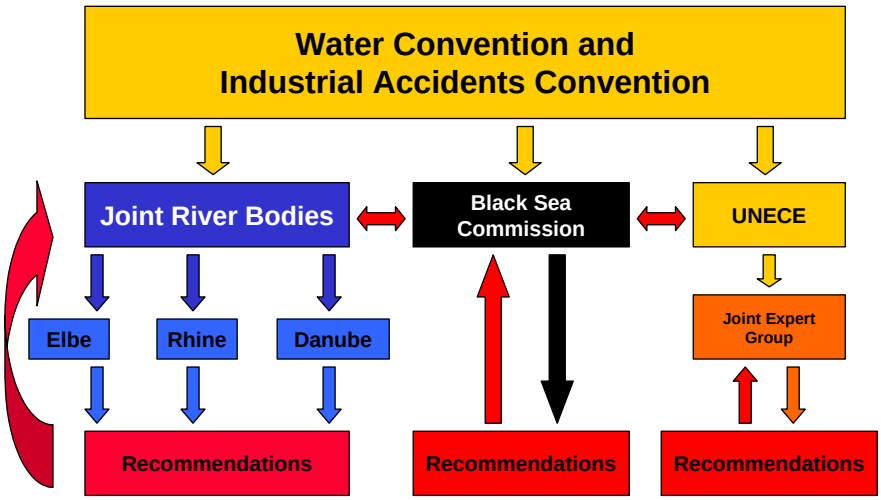
Target of this Step of the project: was to perform plant checks (1-2 days audits/inspections) in view of plant safety, together with the experts from the host country. The developed checklists were supposed to be proved on their practical suitability and developed further.

As basic material for the checklists, lists elaborated during the beginning phase of the project, in Romania and Moldavia, have been used.

With the help of these checklists, the main issues for water protection have been apprehended. For this, the recommendations for the IKSR/IKSE have been taken into account, whereat the checklists reflect the structure of the recommendations.

11.1 International Recommendations

In daily practice, accidents in industrial plants can lead to extensive trans-national effects in lakes and rivers - in particular leading to a restriction in their use as drinking or industrial water as well as causing damages to the ecosystem. A remarkable example is the fire disaster of Santos in the Swiss hall (Switzerland) in 1986 which caused a serious pollution of the Rhine. Fishing in and using the Rhine as a source of drinking water had to be interrupted for several days up to a distance of about 1000 km stretching into the Netherlands. This and other events made it necessary to give the development of an international safety standard a clear direction. The river basin committees for the Elbe, Rhine and Danube can issue recommendations on different aspects of plant safety based on the results of the water and industrial accidents conventions. The black sea commission and other international committees can of course also make recommendations based on the results of the above-mentioned conventions.



The recommendations given by international groups can therefore serve as a manual of recommendations for improving and updating the international safety standards in the area of plant related water pollution control.
The fact that safety measures are not specific to a particular river basin area alone; these recommendations for the Rhine, Elbe and Danube can be used for other areas too.
The following recommendations describe the technical and organizational precautions to be taken when operating industrial plants handling substances hazardous to water. They are based on a concept with which chemical danger potentials are controlled by means of a multi staged technical and organizational safety system.
The recommendations can be divided into three major groups:

- Recommendations for Functional units (e. g. storage, sealing systems, fire prevention etc.)
- Recommendations for Branches (e. g. cellulose industry)
- Recommendations for Risk areas (e. g. contaminated surfaces)

The recommendations can be used in any company handling substances hazardous to water and can be considered as the basis for safety policies in the area of plant related water pollution control.

11.2 The Checklist Method

Application of the checklists method allows the verification of compliancy with basic safety precautions by small plants as well as the verification of compliancy of complex industrial plants with additional plant safety precautions because of the modular structure of the checklists.
Suitable checklists were formulated based on the recommendations of the river basin committees (UNECE).

Recommendation	Join River Bodies	Issued	Checklist
Definition of substances hazardous to water	ICPR	1996	dt, engl, rus,
Licensing procedures for accident relevant plants	ICPR		
Over-fill safety	ICPR / ICPE	1999	dt, engl, rus,
Indoor Pipeline safety	ICPR / ICPE	2001	dt, engl, rus,
Join storage	ICPR		dt, engl, rus,
Sealing Systems	ICPR	1994	dt, engl, rus,
Waste water streams	ICPR	1994	dt, engl, rus,
Transhipment	ICPR	1993	dt, engl, rus,
Fire prevention	ICPR / ICPE	1993	dt, engl, rus,
Plant surveillance	ICPR	1989	dt, engl, rus,
Plant alarm and averting of danger planning	ICPR / ICPE	1997	dt, engl, rus,
Tank equipment	ICPE	Entwurf	dt, engl, rus,
Improving the current accident prevention strategy on the river Elbe	ICPE	1994	
Requirements for plants, regarding the handling of substances hazardous to water, in flood or overfill endangered areas	ICPE ICPDR, ICPO	1998 (revised 2002)	dt, engl, rus,
Storage facilities for substances hazardous to water/hazardous materials	ICPE	2004	dt, engl, rus,
Organizational measures and basic requirements for the prevention of accidents caused by substances hazardous to water	ICPE	2000	
Fundamental elaboration of safety reports in view of water protection	ICPE	1996	dt, engl, rus,
Basic requirements for plants, regarding the handling of substances hazardous to water	ICPE	2002	
Safety Requirements for Contaminated Sites in Flood-risk Areas	ICPDR		engl
Cellulose and paper industry			dt, ru
Refinery	ICPDR	Draft	engl

Table 1: Compilation of the recommendations of the international river basin commissions and the developed check lists

The checklists are divided into 4 major parts:

1. The first part is the organizational and technical recommendations. These will be quoted from the original text.

2. The second part is the method of querying to ascertain if the recommendations are complied with.
3. The measures to be taken are recommended according to the problem. These are organizational and technical measures which are graded in short-, medium- and long-term measures. They can be used by plant operators as investment plan and by the authority as catalogues of demand.
4. The recommendation will determine the risk category, after examinating a sub item (see „Determination of real risk“).

The sequence and the numeration of the single questionings within the checklists, follows the enumeration and the numeration of the recommendations.

The available checklists are meant to help creating a systematic and unitary procedure for the evaluation and assessment of the state of a plant that is handling substances hazardous to water.

Measures and Measure Catalogue

If the requirements of the recommendations are not or just partially complied with, appropriate measures have to be taken by the examinator. The measures should be differentiated into “short-term”, “mid-term” and “long-term” measures. In time meanings, the classification should follow these criteria:

Short-term Measures

The short-term measures will mostly be low cost measures. They can be easily implemented by the plant without external help. These simple technical or organisational measures are meant to immediately improve the situation of the plant, in regard to water protection.

Mid-term Measures

The mid-term measures are technical and/or organisational measures which purpose is to implement the requirements given in the recommendations. The economical productivity of the plant has to be factored in.

Long-term Measures

The long-term measures’ aim is to implement the technical recommendations given after the examination, targeting to comply with the European standards for plant-related water protection.

The measure examples mentioned in the checklists, are meant to be a support for the operator of the checklists, for every single situation that may occur.

11.3 Plant Checks

In the scope of the plant checks, the suitability and applicability of the checklists has been reviewed.

In the selected plants, the checklist method has been applied by the experts from R+D and the national experts (the RIZIKON Company). Both the strengths and the weaknesses have been documented. The focus of the plant visits was to identify the sources of danger, which can lead to major water damages.

Methodically, the inspections represented safety and environment protection audits, focusing on the potential water damages.

Concerning the contents, all plant checks have previously become attuned to the particular plant that was to be inspected.

The following were present at the plant check:

- A plant’s employee in charge
- The responsible representative of the environment authority
- Representative of the RIZIKON company
- Representative of R+D Industrie Consult
- Interpreter

The temporal and organisational sequence of the plant check was determined by the type of plant units to be checked.

The plant check was executed within 1-2 days. An expert from R+D was present at all times.

11.3.1 Plant for Storage and Transhipment of Oily Substances (incl. Harbours)

From August 14, to August 16, 2002 a plant for storage and transhipment of oily substances has been visited. The plant is environmentally approved.

The plant is situated in the outskirts of a big city, in an area with low differences in altitude. Partially it is located right next to the sea, resp. 2-3 km away.

The warehouse, together with its transhipment facilities has the size of 35 ha and is situated in the outskirts of a big city, in a seismic zone. These facilities are located about 3-4 km away from the harbour and the transhipment facility, for loading and unloading the ships.

Picture 1: Tank-truck filling, in the background storage tanks without functional secondary containments

The considered oil harbour is situated in the outskirts of a big city and is used for loading and unloading ships up to 100,000 tons. The harbour and the storing facility are separated from each other.

Five transhipment facilities are available: one for liquid gas, one for crude oil, one for diesel, gasoline and one for mineral oils. The harbour provides for several other facilities as well and is located in a seismic area, where the possibility of earth quakes of 4-5 on the Richter scale cannot be eliminated. I could not be clarified if this matter of fact has been taken into account when the harbour was built.

The main problems for these facilities are the single shell underground tanks, with no leakage indicator, no check ups for the flat bottom tanks, nor the pipelines, on the sealing surfaces, sediments and substance mixtures.

11.3.2 Plant for Water Purification

On August 13, 2002 the plant for water purification has been visited. The plant is environmentally approved.

The plant is situated 30 km away from a big city, in an area with low differences in altitude. The water for purification is being transported 1.4 km, via pipe lines, from the river Dnestr.

Plant 2: Storage of Aluminium Sulphate

The plant supplies drinking water for the city and the nearby towns and communities. Das Werk zur Wasserversorgung dient zur Versorgung einer Großstadt und der umliegenden kleineren Städte und Gemeinden mit Trinkwasser. The plant is situated in the catchment area of the river Dnestr and rehashes about 500-950,000 cubic meter of water daily.

The problems that we found here were, in particular, the sealing surfaces for the storing facilities for solid substances, the single shell basins for substances hazardous to water, without enough retention capacity.

11.3.3 Plant for Storage and Transhipment of Oily Substances

On October 11, 2002, the plant for storage and transhipment of mineral oil products has been visited. It is also environmentally approved.

The plant is situated on the north bank of the Danube, next to the border with Romania, in an area with low differences of altitude, 500 to 1000 m away from the harbour and its transhipment facilities.

The warehouse, with its railway transhipment facility has the size of 25 ha and is located in a seismic and flood endangered area. It is the older branch office of the main plant, being established, resp. built, in 1946.

Beside the lacking protection against over-filling of the containers and the missing surveillance of the tank bottom for the flat bottom tank, following problems have also occurred:

The tanks are rated by the operator as endangered by flood, as a result of long lasting high tight. This is also valid for the restrained fire-fighting water and the water retaining facility; a proof for that is not available.

The static safety against external water pressure is available, according to the operator, but a proof for that is not given.

In the opinion of the operator, the tanks are not protected against washing away; a proof for this could not be given.

Picture 3: Flat bottomed tank with loamy ground and earth walls secondary containment

This also applies to the proof that the bottom edges of the tanks/containers are situated over the water surface, that corresponds to a HQ of 100.

The filling surface is made of concrete of unknown provenience and quality and therefore may not be tight to liquids. The joint type and the surface quality have to be classified as insufficient/unsatisfactory.

Because of the eroded ramparts, the retaining capacity can be queried; this means that secondary containments cannot be considered as sufficiently tight, neither as fire-fighting water retaining facilities, due to their construction, structure and condition.

11.3.4 Plant for Cardboard Production

On July 2nd and July 3rd, 2003, a plant for cardboard production has been visited. It also is environmentally approved.

The plant is situated in the outskirts of a city, lying right next to the Theiss, so in a flood risk area. The plant has been partially flood in the past already. Here waste paper is manufactured into cardboard packaging. The plant is not operating on a regular basis, due to the lack of waste paper.

Here we have found a desolate plant, where beside the “regular” safety problems, we have seen a careless handling of substances hazardous to water.

A concrete signal for a major accident potential was a destroyed heavy oil tank, which has been destroyed by an explosion. The tank still contains the oddments of a water-oil mixture. The traces of an accident at the heavy oil pumping station are still visible as well.

Picture 3: Destroyed heavy oil tank, right next to the Theiss

In a concrete pit, next to the secondary containment, we have found a heavy oil-water mixture, for unknown reasons. According to the operator, this was supposed to become a deposit facility, but never has been put into operation.

Another, quite small example for the careless handling of substances hazardous to water is the production unit. A barrel fall over (for unknown reason) and hasn’t been put back up, nor have the substances dangerous to water been removed. This could have been done without any costs.

It is worth mentioning that the plant is situated next to the river Theiss and the possibility of contamination in case of flooding is given at any time.

11.3.5 Forest Chemistry Plant

On the 2nd and 3rd of July, 2003, we visited a forest chemistry plant, also environmentally approved also. The plant is situated next to the Romanian border, about 1 km away from the rivers Theiss and Schuporka. It is evaluated as not flood endangered and has a total size of about 21 ha.

The old plant is divided into following units:

1. Production of charcoal, made of hardwood- especially beech wood and
2. Former “acetic acid production”:

Until 1995/1996, acetic acid (H3COOH) has been produced here, out of the so called „beech tar“, the waste product from the charcoal production. This acetic acid has been exported to 95% to Russia, as additive, resp. raw material for the metallurgical and perfume industry.

The export to Russia ended, because the above named additives and raw materials were replaced by crude oil products.

These were the main problems of the forest chemistry plant. The still accruing „beech tar“, the stock of „beech tar“, as well as the stock of condensation liquid, the so called “shishka” and the oddments of heavy oil and other oddments had to be temporarily stored.

The real features of the condensate related to water protection, etc. are not known, but are rated as „possibly toxic“, by the environment authorities.

All in one, the Water Risk Class of the available substances (condensate, heavy oil and other residuary substances) has to be rated as at least WRC 2, so that the risk potential is very high, due to the raising amounts of these substances.

- Condensation liquid about 1200 t,
- Beech tar about 700 t,
- Heavy oil about 200 t and
- Other residuary substances about 100 t.

Due to the continuing production of charcoal, the amounts of these substances is raising continuously.

The durability period of the substances, to their use is already exceeded.

A procedure draft is available for the removal of the biggest part of these waste substances. This draft will be presented and evaluated further on.

Furthermore, solid formalin is being stored on the area of the old plant (about 20 t – crystalline)

These substances are being stored in single shell steel containers, without secondary containment and on unsteady ground, in small wreaths (steel jugs of about 20 l capacity), as well as in wooden barrels, with or without cover, made of singles staves, held together by some kind of barrel ring. A secondary containment or such is missing here as well. These containers are inadequate for this purpose.

Picture 4: Small wreaths

All containers are lacking any kind of safety equipment (over-fill safety, fill level indicator, etc.).

The filling is being performed manually or with a transportable pump with a flexible hose.

The ground about the storage containers, the wood containers and small wreath containers is obviously majorly contaminated, to an estimated depth of 1.0 m.

The biggest part of the condensator and the beech tar is stored in single shelled rail way tank wagons, whereat this situation is to be considered as stationary storage. The safety equipment is lacking, as described above. A concrete contamination, comparable with the area described above, could not be obviously noticed, but is not excluded.

The available crystalline formalin is stored inside a cylindrical metal tank, which was improperly carved at the moment of performing the plant check, which implicated that the container lost stability and fell over. This implicated that the formalin was stored, without roofing, on unstable

ground. A part of the formalin flew on the ground. The operators of the plant stated that the formalin will be shortly restore.

Other examples of the careless handling of substances hazardous to water are shown thru the fact that huge amounts of tar and condensate have been found on the ground, resp. in the ground.

11.3.6 Natural Gas Compressing Station

On July 4, 2003 a natural gas compressing station has been visited. The plant is environmentally approved.

The compressor station is situated close to a city. Rivers or other overground waters are not in close proximity.

Picture 5: Filling area of the plant’s petrol station

The compressor station serves as a pressure rising station for the mineral oil pipeline „Sojus” and was built 26 years ago. It consists of 7 compressor blocks. The compressors are turbo, radial style, produced by the British company Cooper- Bessemer and are powered by gas turbine engines. The power of one compressor block is 10 MW.

From the water protection’s point of view, the following plant units are relevant:

- Transformators
- The plant’s petrol station

The plant turned out to be exemplary, in cleanliness and safety issues.

11.3.7 Plant for Motor Vehicle Tyre Production

On July 12 and 13, 2004 we have visited a plant for motor vehicle tyre production. The plant is environmentally approved.

The plant is situated in the outskirts of a city and about 12 km away from the river Dnepr, having a total size of 170 ha.

The in 1956 established plant is an open stock corporation for rubber tyre production. It produces tubed tyres, as well as tubeless tyres, of over 20 types, for: motorcycles, motor vehicles,

trucks, trolleybuses, tractors, heavy duty tipper trucks and tyres for agricultural and road building matters.

Picture 6: Transhipment installation

From the water protection's point of view, the following plant units are relevant:

- Gasoline storage
- Gasoline transhipment
- Glue production
- Gas station

The problems found in this plant were damaged secondary containments, sealing surfaces, missing labelling, missing over-fill protection on the tanks, missing automatic petrol pump for motor vehicle filling up, missing gas pendulum pipelines, resp. open containers with light combustible substances.

11.3.8 Plant for metal productions

On the 16th and 17th of June, 2004, we have visited a plant for metal productions. It is, as well, environmentally approved, according to the national laws.

The plant is located in a closed area of 9 ha, in the middle of a city and about 3 km away from the river Dnjepr. It is not flood endangered.

Picture 7: Guide book for a petrol station

The plant for metal production has been establish about 40 years ago and has a total number of 700 employees. The sales situation is rated as satisfactory, so that it is working to capacity.

The plant units which are relevant for the water protection are:

1. Storage of sulphuric acid,
2. Transhipment of sulphuric acid,
3. Wire stripe facility,
4. The plant’s gas station,
5. Pipelines
6. Iron vitriol production facility.

The main problems for this plant were the missing over-fill safety mechanism and small problems with the sealing surfaces of the secondary containments.

11.3.9 Plant for Nitric Acid Production

On June 14th and 15th, 2004 we have visited the plant for nitric acid production. The plant is environmentally approved, according to the national laws.

The plant is located in an industrial area of a city, in the neighbourhood of the creek Konoplanka, which is linked with the river Dnejpr. The river Dnejpr itself is about 14 km away and is not flood endangered.

Picture 8: Pipeline in the secondary containment area

The plant produces nitric acid out of ammonia (NH3) and has a number of 600 to 700 employees, out of which about 220 work in the HNO3 area. Only 190 of them can be employed at the moment, because of the unsatisfactory sales situation, that hinders a proper production. The ammonia is being delivered via pipeline from a different plant. The HNO3 plant has been established around the year 1976 and the procedure of HNO3 production is based on the “Oswald-procedure”.

Problems that occurred here were multiple damages on the sealing surfaces and the pipelines.

Only little space is available for the filling of small amounts of acid, which does not meet the requirements (examples):

- The concrete is not liquid tight,
- Sloppy ground,

- An uncontrolled flowing away of leakages cannot be eliminated,
- Acid can possibly infiltrate into the rain sewerage,
- No secondary containment for leaking substances.

A working instruction is available for the plant monitoring, which regulates the relevant questions of the plant. Other operating instructions and regulations are also available here.

No reportable event has occurred so far, according to the operator of the plant. Regular checks by experts are being performed and documented, especially for safety relevant units (e.g. Pipelines and containers under high pressure) and wall thickness measuring. The plant's surveillance system presents lacks at the quality of the sealing systems.

12 Evaluation of Plant Checks

Target of this project step: was the evaluation of the checklists that have been worked out during the inspection of the plant. As evaluation criteria we used the national and international standards.

All plant checks have been evaluated by the R+D experts, with the attendance of the expert from the host country. The evaluation is made within teams, considering every single case.

The results of the evaluations have been clearly documented in written form, so that they can be further presented in international seminars and workshops.

Numerous pictures for each checked plant have been added to the documentation.

The most common deficiencies of the evaluated plants have been:

- Damaged sealing surfaces
- Missing secondary containments
- Leakages in the secondary containments
- Pipeline penetrations thru sealing surfaces
- Single shell underground containers
- Single shell underground pipelines
- Missing vehicle „run into“ protection
- No leakage surveillance system for the bottom of flat bottomed tanks
- No riskless waste disposal
- Corrosion of part of the plant
- Missing labelling

The available documentation we have found in the plants is mostly elaborated, but needs an update. Some possibilities are just not taken into account, like the leakage of single shell containers.

During the inspections and evaluations, it has been noticed that the checklists need improvement, for example by including links to other checklist, for easier processing of the results. We also noticed that in some cases the local experts from the host countries had problems to understand and answer all questions included in the checklists, because they were lacking certain

background information. This was the reason why we developed a guide which joins all checklists and provides the necessary background information for the problematic issues.

Results of this step of the project: Picture documentation, reports for the examinated plants, available under /Plant checks/. The edited checklists and the created guide is to be found under /Checklists/.

13 Recommendations for the long-term consolidation of the safety level

Target of this step of the project: is the elaboration of a list of general recommendations for the cross-functional improving potential, as well as a list of specific recommendations.

This job step is one of the most important ones, because here we identified the practical and real realizable improvement actions for an increasing plant safety level. Due to the financial situation of the hosting countries, it became obvious that costly measures, like electric and electronic measures, controls and adjustments, are not worth considering, as short-term measures.

So that the measures of the analysis of the cross-functional improvement potential have been structured into:

- Short-term, mid-term and long-term measures,
- low-cost and cost-intensive measures,
- Hardware and control/training measures.

The organisational measures are mostly low-cost alternatives to technical changes. Nowadays it’s generally accepted and transcribed by the Seveso-II-Guideline that a high safety level can not only be achieved thru technical, but also organisational safety measures.

The recommendations have been engaged based on the examples from the evaluated plants.

They have been presented to a large audience in workshops, international conferences and the plants in the hosting countries. We tried to keep the plants from the given examples anonymous, but the drawing of certain conclusions about the plants couldn’t be fully avoided.

The result of this job step was the elaboration of a measures theses collection, which confronts the deficits of technical and organisational solutions. At this alternatives are permissible.

For the example of a single shell underground pipeline, the measures have been divided as follows:

Short-term measures:

Pressure and tightness proofing of single shelled, underground pipelines.

Mid-term measures:

Replacing single shelled, underground pipelines with overground pipelines.

Long-term measures:

Produce and lay underground pipelines in such a way that the automatic leakage detection and alerting is possible.

Results of this step of the project: Elaborate measure catalogues as appendix for the plant check reports

14 Analysis for the Indentification of the Cross-functional Improving Potential

Target of this step of the project: is to identify a cross-functional improvement potential for the evaluated plants, by means of analysing the weak points found during applying the checklist method.

Here the results of every single plant check has been analysed, to find commonalities and weak points and to identify the improvement potential.

As a result of the analyse, it has been ascertained that the hosting countries do not have updated general rules, for the storage of substances hazardous to water and the equipment of tanks. This was the reason why recommendations for the storage of substances hazardous to water and equipment of tanks have been initiated into the IKSE. The recommendations for the storage have already been enacted last year. The elaborated checklists already contain both of these recommendations.

During our work in Dnepropetrowsk, as well as during the concluding seminar, the local representatives as well as the Black Sea Commission have told us that similar recommendations are needed for the evaluation of pipelines and the updating of the technical regulations. But because it is an extensive and very complex issue, it could not be included in the work of this project, it may become the topic of a future project.

Results of this step of the project: Recommendation suggestions for the ICPE and compiled checklists for the storage of substances hazardous to water, as well as fort he equipment of tanks, can be found under /Checklists/.

15 Elaborating a Safety Report

Target of this step of the project: is the exemplary elaboration of a safety report with an operational alarm and an averting of a danger plan.

For the elaboration of the safety report, we chose a plant that produces high concentrated nitric acid.

The structure and the contents of the safety report are given by the Seveso-II-Guideline.

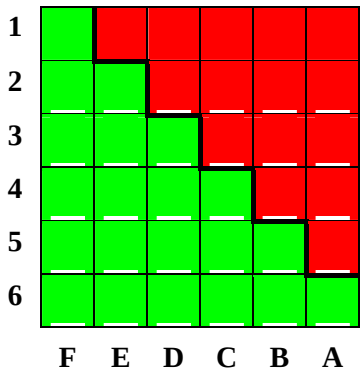
The requirement catalogues of the 2nd Accident Administrative Fiat (Germany) and the ones from the UK are available at R+D. The safety report has been compiled according to the requirements of the 2nd Accident Administrative Fiat. For the alert and averting of danger plan the 3rd Accident Administrative Fiat has been followed. A sufficient documentation about the plant, e.g. construction plans and R+I flowcharts, is required for the elaboration of a safety report.

Together with the experts from the hosting country we have looked up this documentation, in the evaluated plant and clarified why it is so important for the elaboration of the safety report.

Hereby we realized that not all documents are up to date and we pointed this out, but the correction of the defects has not taken place during the project, because our main aim was to present the systematic procedure of elaborating a safety report and not to determine the real risk of the plant.

The safety report describes the whole safety management system and includes the technical and organisational aspects as well as the plant’s emergency plan.

Methodically, the accident risks have been determined based on the Risk Profile[3] . The Risk Profile[4] is illustrated in a 6 × 6 Matrix:



The project's safety report has been structured so that it will serve as an example fort he elaboration of other safety report, in the hosting countries, resp. for other regions and branches.

This safety report's structure is as follows:

[3] This method increases the safety level, after implementing certain measures, for example if an event from box B3 moves to box D3, thanks to safety measures that have been taken.

[4] Die Arabic digits 1 to 6 denote the possible or occurrence of an event, so that 1="rare" to 6= „only theoretically possible", the letters denote the effects, beginning from F="no effects" to A="disaster".

Result of this step of the project: is an exemplary safety report with the plant's alert and averting of a danger plan, to be found in written form under /Safety report/.

16 Elaborating a Cross-functional Emergency Plan, With the Inclusion of the Local Authorities

Target of this step of the project: is the elaboration of a cross-functional emergency plan, with the inclusion of the local authorities.

On request of the Ukrainian Ministry of Environment, the emergency plan has been elaborated for a sewage treatment plant. The plant is located on both sides of the river Dnestr, which represents the border between Moldavia and the Ukraine. The connecting pipelines, between the left and the right bank of the river are out of order, at the moment, this means that residual water is flowing straight into the Dnestr.

For the elaboration of the emergency plans, we used to experience and the guidelines from the emergency plan „Rhein“, turning the attention especially to:

- Communication means, Communication ways
- Responsibilities on the part of the participating countries
- Technical equipment and responsibilities on the part of organisations for danger defence (fire fighting, emergency services, etc.),
- Preliminary scenarios, exercises,
- Regular contacts between the authorities from every participating country

This emergency plan can serve as a case example. The elaborated plan is meant to be taken over, to other regions and plants and help elaborating a “copy”.

Results of this step of the project: Cross-functional emergency plan in written form is available under /Emergency plan/.

17 Elaborating Safety Technical Guidelines for the Surveillance and Development of the Policy

Target of this step of the project: is the elaboration of a recommendations catalog for the guidelines for the surveillance of plant handling substances hazardous to water. An authority and NGOs structure should be favourite.

Aim of this step was, in the background of an analyse by the authorities and NGOs in the hosting country, the elaboration of a recommendation catalogue for the implementation of:

- An authorisation structure, according to the requirements of the EC area
- A surveillance structure
- A surveillance on a detailed technical and non-technical level, by an NGO (e.g. by expert organisations, certification organisations, etc.).

The background for this policy is the EU guidelines (Seveso-II, IVU, UVP, Water scope guidelines, etc.) and other supranational obliging agreements (UN ECE Convention).

The aim of this phase was the implementation of these laws by adjusting to the national requirements and demands.

Additionally, a recommendation for a regulation for the protection of ground and surface water , for plants handling substances hazardous to water, has been elaborated.

The recommendation contains the following aspects:

§1 APPLICATION RANGE ANWENDUNGSBEREICH

§2 BASIC REQUIREMENTS

§3 CLASSIFICATION INTO RISK LEVELS

§4 TECHNICAL REQUIREMENTS FOR PLANTS

§5 PLANTS IN SANCTUARIES

§6 MEASURES IN CASE OF AN ACCIDENT

§7 REPORTING REQUIREMENTS

§8 PLANT MONITORING

§9 EXPERTS

§10 EXCEPTION FROM THE TECHNICAL PLANT DUTY

§11 TECHNICAL SURVEILLANCE ORGANISATIONS

§12 PROOF OF THE TECHNICAL PLANT FEATURE

§13 EXISTING PLANTS

§14 INFRINGEMENTS

§15 COMMENCEMENT

APPENDIX I: DEFITIONS

APPENDIX II (FOR §2, PARAGRAPH 7)

APPENDIX III (FOR §4§3)

APPENDIX IV (ZU §4) SECONDARY CONTAINMENTS

Based on these technical regulations, the state administrative acting, regarding to the plant-related water protection for endangered industrial plants, could be coordinated and ascertained, in the future. The potential, complete or partial application, of this recommendation is presently being proved by the Ukrainian Ministry of Environment.

Results of this step of the project: Elaborated recommendations for the regulation for the protection of ground and surface water, for plants handling substances hazardous to water, can be found under /Recommendation Regulation/.

18 Contact Placement With German Authorities

Target of this step of the project: German companies are market leaders in many areas, in the field of environment protection technology. The branches relevant for the improvement recommendations are to be identified. Contacts with the plants in the hosting countries are to be established. A concrete presentation of the productions is aspired.

During the processing of the project, some weaknesses, which could have been remedied or soothed, by means of technical protectors, have been identified.

The safety facilities are usually provided by German suppliers, who offer, for example, linings for secondary containments, and protection facilities in case of fire outburst or explosion. The level of quality of the German providers is that of the world market, in some cases the German providers even are world market leaders.

A common interest exists, from the side of the plants in the hosting countries, as well as from the German providing companies, interest which only is retarded by the small buying power of the local companies.

R+D got in touch with these companies. German providing companies have been animated to cooperate (partly by disclosure, partly by telephone contacting). This way we contacted companies which produce and sell, for example, products with general construction supervision approval, by the German Institute for Architectural Technology.

Not all companies that we have contacted were ready to cooperate, mostly fearing financial problems with the companies in the hosting countries. Another part of the companies was theoretical ready to cooperate, but couldn’t participate at the seminars, because of a full schedule.

Only few companies have actively cooperated on our project, like for example Draeger Safety and Naue Fasertechnik GmbH.

The cooperation on the project has been performed by:

- Supplying with written information material about the products,
- Cooperation at one (or more) regional events,
- Participation of German company experts at the plant inspections, to provide them a first hand impression about the needs of that plants in the hosting countries,
- Inviting important representatives from the plants in the hosting countries to visit the German companies,
- Contact placement between the local representatives of the German companies in the hosting countries and the plant representatives, where plant checks have been performed, resp. safety reports have been elaborated

As a return service for the contact placement, the companies have helped us organize the events during the project.

Results of this step of the project: Contact placement with the national representatives of the German companies, elaborating an address list with the addresses of the cooperating companies, resp. the addresses of the companies who showed interest. The lists are to be found under /Addresses/.

19 Training of Local Experts

Targer of this step of the project: Selecting the experts from the authorities and NGOs and organising trainings/exchange of experiences in view of an effective plant check for the permission and surveillance.

The training of local experts is very important for the main target of the project. Especially in the Ukraine, we have to pay attention to the fact that, due to the countries past, there is no clear separation between the authorisation and surveillance authorities, the environment protection organisations, on one side and the plants, on the other side.

The aim of the project was to train experts who:

- Support the plant's internal interests of safety and environment protection
- Monitor the plant's external interests of safety and environment protection

On July 1, 2003, we implemented a seminar in Ushgorod, where only plant internal and external inspectors have been trained how to use the checklists. Inspectors from different branches, in the whole Transcarpatian area have participated. The seminar has been a big success. A participants name list and the agenda are attached.

A second seminar has been implemented in October 2003. From Oct. 5 to Oct. 10, 2003 we implemented a seminar which was designed like an informational trip to Germany, to get to know the ecological and technological safety system in this country. The aim was to present the work of the authorities in different areas of activity, as well as to present the development level of the safety engineering, in Germany. Representatives from the Ukraine, Moldavia and Armenia have taken part. The summarising report is attached.

Results of this step of the project: For the seminar in Ushgorod a participants name list and the agenda have been added, under /Seminar July 2003/. The summarising report for the trip to Germany has been added under /Seminar trip 2003/.

20 Seminars and Trainings for the Application of the Checklist Method, for the Safety-related Examination and Evaluation of Water Protection Relevant Plants

20.1 Background

During the consultations for the project, especially during the seminar in Jalta, Sept. 13-15, 2004, the representatives of the Ukrainian Ministry of Environment and the local inspectors requested more trainings and seminars on the application of the checklist method and its connection with the Ukrainian law system and the correspondent plant internal and external inspections, in the Ukraine. The aim was to implement the checklist method all over the country.

For this matter, a number of seminars and trainings for presenting the method for plant examination and evaluation to the inspectors have been planned. After these seminars, the inspectors should be able to examine a plant's safety level.

20.2 Target of the Seminar

The implementation and evaluation of the checklist method, for the examination and evaluation of plants, is going to be presented to the local and regional inspectors. By using the checklists, by the trained inspectors, the effectiveness of safety-related checks is going to be increased.

This is the basis for a safety level improvement, in regard of water protection.

20.3 Elaborating the training material

Target of this step of the project: Compiling enough training material

For an effective preparation and implementation of the seminars, documentations, such as presentations and examples for the recommendations and measures for increasing the safety level, have to be elaborated.

Results of this step of the project: The presentations and examples are to be found under /Training/Presentations/.

20.4 Location of the seminars

The seminars and trainings are being implemented in the main industrial regions of the Ukraine.

The following cities with major environmental problems have been suggested:

- Febr. 1-4, 2005, Dnepropetrowsk (on of the most important industrial city of the Ukraine)

- Nov. 29 – Dec. 2, 2005, Charkov (one of the most important industrial and university city in the Ukraine).
- Kertsch (an important city by the Black Sea).

20.5 Participants

The seminars are meant for the inspectors from plants, authorities and surveillance organisations in the specific regions. They have been leaded and implemented by R+D Industrie Consult and Rizikon representatives, in cooperation with the regional national organisations and a representative of the Regional Office of Environment, Brandenburg (Germany), who has a lot of experience with inspections of surveillance needy plants.

The participant name lists are available in the particular folders for each seminar.

20.6 Agenda

All seminars have been planned as 4-days seminars, with the regular following agenda:

1st and 2nd day:

- Presenting the topic of the seminar and giving a short overview of the checklist method
- Procedure of plant checks
- Classification of substances hazardous to water
- Storage facilities
- Transhipment facilities, etc.

3rd day:

- Exercises at the plant
- Discussions

4th day:

- National law system
- The Checklist method as canonical method in the Ukraine
- The Checklist method as an aid for the elaboration if the Safety Declaration of the Ukraine

During these seminars we have learned new things, as well. In the first seminar, on the first 2 days we only held lectures, which were meant to form the theoretical basis. Hereby we realized that this method wasn't too popular with our participants. For the second seminar, we prepared exercises on exemplary plants. The first exercise, on the first day, was the common processing of a checklist. On the second day, the participants were divided into 3 teams and processed and discussed the given examples on their own.

During the 3rd seminar, the example has been also discussed on the 4th day as well. So that the teaching of the theoretical basis has been eliminated in favour of the practical part, but thru this the seminar became more diversified and the result was a better understanding of the checklist method.

As a remark for the future – it should be taken into consideration to build up the seminar on a 5-days basis, so that all checklists can be theoretically presented, as well.

Results of this step of the project: The agenda and the participants name lists are attached under /Training/.

20.7 First seminar and training

Between the 1st and 4th of February, 2005, a seminar with the title „Plant-related Water Protection“ took place at the national mining college in Dnepropetrowsk. The seminar has been implemented under the order of the Federal Ministry of Environment, Conservation and Reactor Safety and the content has been elaborated together with the national Environment Office in Dnepropetrowsk and the German Federal Environment Agency (UBA).

Target of the practical seminar was to draw the attention of as many local and regional Ukrainian inspectors on the plant-related water protection issue. By means of the presented checklist method, the participants got to know how an industrial plant safety check has to be done.

20.7.1 The Seminar

The application of the checklist method has been practiced with the seminar participants, during the plant visit.

Mr. Dieter Reimer, from the German Federal Ministry of Environment welcomed the about 50 participants from environment authorities and industry, presented the meaning of the event and opened the congress. The Ukrainian representatives who welcomed the participants were Elena Schlumukova, Ministry of Environment, Kiev and Oleg Molchanow, manager of the national Environment Authority, Oblast Dnepropetrowsk.

Then Mr. Gerd Winkelmann-Oei, from the UBA took over the technical leadership and presented the aims of the seminar:

- Accepting the checklist method as an examination and evaluation tool, by the Ukrainian environment inspectors,
- Approving the method as an aid for performing national and international regulations, as well as
- The poss. further development of the checklist method, based on expert discussions.

In his introductional speech, Mr. Winkelmann-Oei talked about accidents with major effects of the waters, like for example the accident in Baia Mare or the fire in Sandoz and presented possible technical measures for the future prevention of these accidents.

The speech showed clearly where the omission of prevention and safety measures can lead.

Mrs. Kerstin Tschiedel, Regional Environment Office, Brandenburg, then imparted the Technical Basics for the Safety Philosophy. She presented the connection between the production/plant and humans/environment, related to the plant safety. After that she presented, in detail, the different safety levels: minimum requirements, high requirements and special requirement, corresponding to the plant units that will be analysed.

Next, Mr. Jörg Platkowski, R+D Industrie Consult, Uslar presented the idea of the checklist method and the way of using them. In regard of the predefinition of the required measures and the remediation priorities, exemplary technical suggestions were given.

Then, Mr.Vasilii Andreev from the National Environment Authority in Dnepropetrowsk encouraged the participants to use the checklist method. He expressed that he hopes on an improvement of the necessary national surveillance and the equality of treatment of the plants that have to be monitored.

Picture 9: Seminar participants

Within a further presentation, Mr. Platkowski explained the „Division of the plant/production area and the determination of the risk potential“. Terms like „storage facility“, „transhipment facility“, „production facility“ have been explained with the help of drawings.

In his lecture about the “Filling and Transhipment of liquids hazardous to water”, Mr. Platkowski presented all technical requirements for transhipment surfaces and the way of handling contaminated precipitation water.

Following, Mr. Konrad Kulpock, R+D Industrie Consult, Uslar lectured about the „Safety of industrial pipelines”. Missing joints and connections have been presented and visualised as weak points. He added the request for tightness check ups and steady controls. Then Mr. Kulpok talked about the necessary technical equipment of storage tanks and presented various possibilities for over-fill protection and leakage indicators.

The general safety measures to be taken for storage facilities, like interval limits and the joint or separate storage of various substances and the possible dangers if rules are not followed, have been the topic of the next presentation of Mrs. Tschiedel.

After a spry final discussion and short summary, Mr. Herr Winkelmann-Oei ended the first day of the seminar.

The second day’s motto was: checklists for certain risk areas and organisational concepts for the whole plant.

The moderation job has been taken by Mr. Walter Reinhard, Government Presidium, Darmstadt, who welcomed the participants and encouraged them to the active cooperation on the project.

In the first presentation, Mr. Kulpok presented the topic „Sealing systems“. The main properties, like media resistance, tightness and resistance against mechanical stress have been presented to the participants with the help of practical examples. Also the joint problem and the analysing of the tight surfaces, e.g. with the help of the Schmidt hammer, have been made clear.

In the second presentation, Mr. Kulpok talked about „Waste Water Streams“. The types of waste water that can be found in production plants and stores, like precipitation water (polluted or not), production waste water and faecal water and their treatment has been discussed. Special technical treatment facilities, like settling tanks have been presented.

In a recent article, Mr. Platkowski talked about „Floods and plant-related water protection“. As an example, the devastating flood of the Elbe River has been recalled. The participants have been informed with help of technical examples, like how to protect and brace tanks against high waters. Following, in his presentation about „Fire Protection“, Mr. Platkowski presented the need to retain the contaminated fire fighting water, for the protection of the waters. The necessary retention capacity, e.g. for storage facilities, can be calculated by simple calculation models.

Picture 10: The executive board

(from the left to the right: . Elena Schlumukova, Ministry of Environment of the Ukraine, Prof. Grigori Schmatkow, Ecology consultant of the National Administration for the region of Dnepropetrowsk, Oleg Molchanov, manager of the national Environment Office in the region of Dnepropetrowsk, Dieter Reimer, Federal Ministry of Environment, Conservation and Reactor Safety)

Another presentation of Mrs. Tschiedel referred to the complex topic „Plant related alert and danger prevention”. The elaboration of an internal emergency plan has been presented, in detail. Also important for the participants was the description of the various alert phases and their coordination with the authorities.

After the lunch break, the topic of old neglected deposits of toxic waste, which will become more and more important for the project, in the future, has been introduced. Ms. Hermine Weber, Federal Environment Office, Vienna, presented the actual state of the evaluation of water risk, due to old neglected deposits of toxic waste and contaminated locations of old toxic waste, in flood risk areas.

The so called M1-/M2-Method has been introduced, with whose help a structured strategy fort he assessment of old toxic waste (and its location) and its risk potential, has been elaborated, in the catchment area of the Danube.

Mr. André Dahn, MUC GmbH, completed this speech, with his comprehensive presentation about the „Application of the checklist method for the examination of risk situations on surfaces suspect of old neglected toxic waste, in flood risk areas“. Under the consideration of protected water, he presented, among others, risk potentials and technical safety measures.

The presentations stimulated many questions, because the topic of old neglected toxic waste is a major problem for the environment. The question of costs, who will pay for the reclamation of the contaminated sites of a national plant, has been discussed as well.

Later, on request of several participants, Mr. Reinhard presented the water-related law structure of the Federal Republic of Germany and the federal states. The European influences, as well as the water-related guideline and the IVU-Guideline have been shortly discussed.

Mrs. Tschiedel lectured about the „Plant monitoring“. The surveillance system, consisting of self control, examination by independent experts and authority controls, has been presented and discussed.

In his final lecture, „Strategy in case of an accident“, Mr. Reinhard explained, with the help of practical examples, how the operator of the plant and the authorities have to implement short-term measures, if an accident occurs. The lecture has been featured by pictures of real plant accidents.

20.7.2 Plant Inspection

On the 3rd day of the seminar, the practical knowledge assimilated the days before, was to be practically exemplified. For this matter, a plant has been chosen, with the help of the regional Environment Office in Dnepropetrowsk. The thermal power station “DNEPROENERGO” was ready to support our practice day.

For the beginning, the engineer Grigori Fesak presented the plant as being on of the biggest thermal power stations in the Ukraine. As fuel they are, usually using coal from the Donezk-Basin, but also gas and masut. The plant is located right next to the river Dnepr and is its using water for the production.

Picture 11: Teamwork

Checklists for various units have been applied within 3 teams:

The first team worked on the checklists for plant monitoring and the alert and danger prevention plan. Hereby the environment law systems in Germany and in the Ukraine have been passionately discussed.

The second team discussed the problems about the risk of contaminated sites, in flood risk areas. The contaminated site that has been analysed was a ash-mud basin, located near the river Dnepr. The ashes produced in the plant are being stored in a course of the river. The team detected a high risk potential. With the help of the checklist, they also determined that the risk does not increase in case of flooding, but the team recommended effective measures to be taken, for prevention.

The third team analysed the storage and the transhipment of the fuel masut. The first step was the division of the plant into smaller units and analysing which checklist applies to which unit. After visiting the plant, the single questions from the checklists have been discussed. The Ukrainian inspectors used these discussions, to find out all theoretical and practical details about the plant.

At the end of the day, each team presented its results to the other participants.

On the last day all previous discussions about the national law system in the Ukraine came to a conclusion.

Mr. Andrejew, from the regional Environment Office Dnepropetrowsk and Mr. Landesmann, from RIZIKON (Ukraine) stated in their speeches that, even if it is not to be found in the Ukrainian legislation, the checklist method is a practical help for the national experts, to fulfil their daily job.

Picture 12: Masut - Tank

Mr. Winkelmann-Oei concluded, in his final speech, that the checklists have to be seen as „living documents“. By practically using them, they can and should be further elaborated and improved. While applying the checklist method, unknown problems of the analysed plants can show, problems which will lead to new recommendations. New perceptions of the Joint River Bodies and other international committees, which will be issued as recommendations, will also be included in the further development of the checklists, so that the continuous updating and improving of the checklist method is warranted.

The seminar ended with the ceremonial handing out of the participation certificates.

20.7.3 Results

- Acceptance and the introduction of the checklist method and a simple method for the systematical and structured examination and evaluation of water-related plant safety.
- Recognition of the method as being an aid for the implementation of national and international regulations.
- Review on the too numerous theoretical presentation. The participants asked for more plant inspections, where the checklists can been applied.

20.8 Second seminar and training

Between Nov.29 and Dec. 2, 2005 a seminar with the title „Plant-related water protection” took place in Hotel Kiewki in Charkow.

The seminar has been implemented under the order of the Federal Ministry of Environment, Conservation and Reactor Safety (BMU) and the content has been elaborated together with the national Environment Office in Charkow and the German Federal Environment Agency (UBA).

Target of the practical seminar was to sensitize many local and regional Ukrainian inspectors to the plant-related water protection issue. By means of the presented checklist method, the participants got to know how an industrial plant safety check has to be done.

The application of this method has been presented to the participants during plant visits.

20.8.1 The Seminar

Mr. Moiseenko, from the Ukrainian Ministry of Environment and Mr. Sadniprowski, vice manager of the Environment Office in the area Charkow, welcomed the about 50 participants from environment and industry, showed the importance of this event and opened the congress.

Then Mr. Winkelmann-Oei, UBA took over the moderation of the first seminar day.

In his introductional speech, Mr. Winkelmann-Oei talked about accidents with major effects of the waters, like for example the accident in Baia Mare or the fire in Sandoz and presented possible technical measures for the future prevention of these accidents. The speech showed clearly where the omission of prevention and safety measures can lead.

Mrs. Tschiedel, Regional Environment Office, Brandenburg, then imparted the Technical Basics for the Safety Philosophy. She presented the connection between the production/plant and humans/environment, related to the plant safety. After that she presented, in detail, the different safety levels: minimum requirements, high requirements and special requirement, corresponding to the plant units that will be analysed.

Next, Mr. Jörg Platkowski, R+D Industrie Consult, Uslar presented the idea of the checklist method and the way of using them. In regard of the predefinition of the required measures and the remediation priorities, exemplary technical suggestions were given.

Prof. Schmatkow, consultant of the Ukrainian Ministry of Environment, encouraged the participants to use the checklist method. He expressed that he hopes on an improvement of the necessary national surveillance and the equality of treatment of the plants that have to be monitored. The also stated that the Ukrainian committees are discussion if to introduce the checklists as a legally binding document.

Picture 13: Seminar participants

Within a further presentation, Mr. Platkowski explained the „Division of the plant/production area and the determination of the risk potential“. Terms like „storage facility“, „transhipment facility“, „production facility“ have been explained with the help of drawings.

After the presentation for general safety precautions for storage facilities, like interval limits and the joint storage of various substances and retention of possible leaking media, by Mrs. Tschiedel, as well as Mr. Kulpoks (R+D Industrie Consult, Uslar) presentation for the necessary technical equipment of storage tanks and various possibilities of over-fill safety and leakage indicators, the day ended with the presentation and discussion about the examination of an ex-

emplary plant. The plant unit we talked about is a storage facility, consisting of a flat bottom tank. The checklist “Tank equipment” has been applied and discussed in this case.

The second day had the motto: checklists for certain plant units and organisational concepts for the whole plant.

The moderation has been taken over by Mr. Moiseenko.

Topics like Sealing Systems, Waste Water Streams, Transhipment of substances Hazardous to Water, Fire-fight water retention and Safety of Pipelines have been discussed.

A highlight of this day were the given practical examples. Within 3 teams, examples for the topics Storage of Solid Substances, Fire-fighting Water Retention and Pipeline Systems have been worked out. The participants tried to solve their tasks independent, within the teams. When the teams presented their results, it became clear that the tasks have been solved, with the help of the checklists.

20.8.2 Plant Inspection

On the 3rd day of the seminar, the practical knowledge assimilated the days before, was to be practically exemplified. For this matter, a plant has been chosen, with the help of the regional Environment Office in Charkow. The cable production plant, “Südkabel” was ready to support our practice day.

Picture 14: Storage facility

Within 3 teams, the checklists for various topics have been applied:

The first team analysed the storage of substances hazardous to water in underground and overground tanks. The first step was the divide the plant into functional units and check which checklist applies to which unit. After the plant inspection, the single questions of the checklists have been discussed. The Ukrainian inspectors used these discussions to find out all theoretical and technical details.

The second team dealt with the problems of plant monitoring and alert and risk prevention plan. To have a cleared view over the problem, Mrs. Tschiedel presented the background information within two short lectures. The main discussion was lead by the differences between the environment law system in Germany and the Ukraine.

The 3rd team examinated and evaluated a transhipment facility for substances hazardous to water.

On the last day all previous discussions came to a conclusion. After a detailed presentation of the law system in the Ukraine, by Mr. Landesmann, Rizikon (Ukraine) it became clear that even if the checklist method is not an official law yet, it is a practical help for the national experts, to fulfil their daily job and it is compatible with the national laws.

The seminar ended with the ceremonial handing out of participation certificates.

20.8.3 Results

- Acceptance and introduction of the checklist method and a simple method for the systematic and structured examination and evaluation of water-related plant safety.
- Recognition of the method as being an aid for the implementation of national and international regulations.

20.9 Third seminar and training

September 5th to September 8th, 2006, another seminar with the topic “Plant-related Water Protection“ took place in the Profilaktori „Zaliv” Geroewka in Kertsch.

The seminar has been implemented under the order of the Federal Ministry of Environment, Conservation and Reactor Safety (BMU) and the content has been elaborated by the German Federal Environment Agency (UBA).

Target of the practical seminar was to sensitize many local and regional Ukrainian inspectors to the plant-related water protection issue. By means of the presented checklist method, the participants got to know how an industrial plant safety check has to be done.

The application of this method has been presented to the participants during plant visits.

20.9.1 The Seminar

Mrs. Kapustjan, from the Ukrainian Government Office welcomed the about 40 participants from environment and industry, showed the importance of this event and opened the congress.

Then Mr. Winkelmann-Oei, UBA took over the moderation of the first seminar day. In his introductional speech, Mr. Winkelmann-Oei talked about accidents with major effects of the waters, like for example the accident in Baia Mare or the fire in Sandoz and presented possible technical measures for the future prevention of these accidents. The speech showed clearly where the omission of prevention and safety measures can lead.

Picture 15: Seminar participants

The first 2 days went off similar to the seminar in Charkow, at the end of last year.

The main focus was the introduction of the checklist method and some practical examples. Within 3 teams topics like Storage of Solid Substances, Fire-fighting Water Retention and Pipeline Systems, have been discussed. The seminar participants tried to solve the tasks independent within the teams. Afterwards, during the presentation of the results it became clear that after using the right checklists, the tasks have been solved easily.

20.9.2 Plant Inspection

On the 3rd day of the seminar, the practical knowledge assimilated the days before, was to be practically exemplified. For this matter, a plant has been chosen, with the help of the regional Environment Office in Kertsch. The ship repair plant was ready to support our practice day.

Picture 16: Team discussion at the plant

Within 4 teams, the checklists on various topics have been applied:

The first team analysed the storage of substances hazardous to water, diesel in an overground tank. The tank is being filled with diesel and waste oil, which is then transported, via pipelines, to a burner. First the plant has been divided into functional units and the team analysed which checklist applied to every single unit. After the plant inspection, the single questions of the checklists have been discussed. The Ukrainian inspectors used these discussions to find out all theoretical and practical details.

The main problems that occurred were:

- No secondary containment
  Short-term measures: informing the personnel and daily checks by the personnel
  Mid-term measures: creating a provisional secondary containment
  Long-term measures: creating a tight, big enough secondary containment with proof

Picture 17: Tank containing a mixture of diesel and waste oil

- No fire-fighting water retention
  Mid-term measures: creating a provisional secondary containment
  Long-term measures: creating a tight, big enough secondary containment with proof

- Leakages in the pumping room
  Short-term measures: informing the personnel and daily checks by the personell, finding and removing leakages
  Mid-term measures: build new, tight joints. Proof the media tightness of the joints.
- Missing secondary containment under the pipeline connections
  Short-term measures: create provisional secondary containment under the mobile pipeline connections
  Mid-term measures: build fixed or secured connections
- Missing labelling
  Short-term measures: coloured labelling of the pipelines, labelling of tanks
- Missing filling facility, missing filling indicator and missing over-fill protection
  Short-term measures: informing the personnel, filling should only be performed by 2 persons
  Mid-term measures: Installing a level indicator
  Long-term measures: install filler pipes and over-fill safety system.

The second team analysed the wreath storage of mineral oils,

In this case, following problems occurred:

- Damaged secondary containment
  Short-term measures: informing the personnel and daily checks by the personnel
  Mid-term measures: repairing the damaged spots.
  Long-term measures: creating a proper tight surface, with proof.
- No flood protection
  Short-term measures: informing the personnel and daily controls by the personnel, in case of danger relocation to area with no flood risk.
  Mid-term measures: construction of embankments, to derive the high water.

Picture 18: Wreath storage for mineral oils

- Defects at the joint storage
  Short-term measures: combining the substances and dangers
  Mid-term measures: evacuate the substances that cannot be stored together
- Defective fire protection
  Mid-term measures: elaborating a fire protection concept
  Long-term measures: purchase bigger and better fire fighting technology
- Missing labelling
  Short-term measures: marking spaces and wreaths

The 3rd team analysed the wreath storage of solvents.

The main problems were:

- No secondary containment
  Short-term measures: informing the personnel and daily checks by the personnel,

  Mid-term measures: creating a provisional secondary containment
  Long-term measures: creating a tight, big enough secondary containment with proof
- No fire-fighting water retention
  Long-term measures: creating a tight, big enough secondary containment with proof, e.g. by mobile fire-fighting water barriers
- Defects at the joint storage
  Short-term measures: combining the substances and dangers
  Mid-term measures: evacuate the substances that cannot be stored together
- Defective fire protection
  Mid-term measures: elaborating a fire protection concept
  Long-term measures: install fire detectors
- Missing labelling
  Short-term measures: marking spaces and wreaths

The 4th team analysed the storage of fuel oil in 2 flat bottom tanks. These tanks were out of order, this means they haven't been filled and emptied anymore, but they still were half full.

So that the team found the following problems:

- Damaged secondary containment
  Short-term measures: informing the personnel and daily checks by the personnel
  Mid-term measures: remove plants from the secondary containment, fix the damaged spots.
  Long-term measures: creating a proper tight surface, with proof

Picture 19: Destroyed tight surface, by plants

- External corrosion
  Mid-term measures: derust the tanks and coat with corrosion protection
- Missing double bottom
  Short-term measures: informing the personnel and daily checks by the personnel
  Long-term measures: install a double bottom

On the last day all previous discussions came to a conclusion. First the teams presented their work from the previous day to the other participants.

The highlight of this day was the presentation of a method for determination of the real risk. This method has been elaborated during the implementation of the UNDP-GEF powered project "Activities for Accident Prevention - Pilot Project - Refineries".

The real risk of a plant can only be determinated after a detailed examination and evaluation of the specific plant. The checklist method suits this matter perfectly. Thanks to the checklists, various plants can be examinated and then evaluated, on the basis of international recommendations.

Building on this method, we developed a possibility that allows us to determine the real risk potential of a plant.

This method has been implemented the day before within the team work. The result was that the plant has a high real risk.

The seminar ended with the ceremonial handing out of the participation certificates.

20.9.3 Results

- Acceptance and introduction of the checklist method and a simple method for the systematic and structured examination and evaluation of water-related plant safety.
- Recognition of the method as being an aid for the implementation of national and international regulations
- We have received concrete examples for the improvement of the method for real risk determination.

21 Preparation and Implementation of International Seminaries

Target of this step of the project: Presenting the project to all participants in the hosting country.

Our purpose is powered by the multiplication effect, this was the reason why the presentation of our aims, the interim results and the final results was so important for the success of the project.

All activities have been attuned in detail with the orderer of the project and additional to this, we enjoyed the support of several international committees.

For the achievement of our aims it was important to create a „we“-feeling, between the German representatives, the participants from the hosting country and the international representatives. .

Five seminars have been organised in the hosting country:

1. 27.06.2002 to 30.06.2002 in Odessa (Documents under /Seminar Juni 2002/)
2. 14.10.2002 to 15.10.2002 in Odessa (Documents under /Seminar Oktober 2002/)
3. 21.08.2008 to 22.08.2003 in Ushgorod (Documents under /Seminar August 2003/)
4. 10.06.2004 to 11.06.2004 in Dnepropetrowsk (Documents under /Seminar Juni 2004/)
5. 13.09.2004 to 15.09.2004 in Yalta (Documents under /Seminar September 2004/)

The participants from the last seminar in Yalta rated the results of the project as positive and stated that the project “Technology Transfer for Plant-Related Water Protection in Romania, Moldavia and the Ukraine“ is an important contribution to the strong international cooperation in this important field, between all participating countries.

At the end of the project, a representative from each participating country signed a document, to certify the results.

The participants stated how important the results of the project are for the solving of present problems and recommended:

- The checklists should be used by the operators of the plant, the monitoring authorities, as well as by the expert organisations, for examinating and evaluating plants. It has also been recommended to name the checklist method as official examination and evaluation method, within the national policies (e.g. administrative fiat).
- Integrate the discussed regulation for ground and surface water, originating in plants handling substances hazardous to water, in the national law system and use this regulation in all national institutions,

- Use the experience, gained during the project, for other sensitive branches, where various kinds of use are close together (industry, house constructions, agriculture, tourism) and where accidents, flooding damages or ecological disasters may endanger the environment and humans.

At the same time with the implementation of the seminars, an international project leading team held special meetings, to solve further project tasks.

For each seminar, R+D handed out to all participants, a folder with the most important documents in German and Russian language.

Results of this step of the project: For documents for the single seminars, see the summary.

21.1 Seminar in Odessa, June 27- June 30, 2002

Objective target of the consultation:

1. For the success of the project as a whole, it was important to establish the contact with the relevant persons and institutions in the hosting country, like the Ukrainian Ministry of Environment, and Natural Resources, the representatives from the national Environment Inspections and the experts from various NGOs and present the target of the project to each of them. This also helped us react in time to the particular features of the hosting country.
2. For the effective execution of the project it was important to set a target and to verbalize the results that were to be achieved, as well as to include experts in our working groups. (principle mandate).
3. Aim was to win a first impression of the Ukrainian environment laws and of the implementation of this law by the environment inspectors.
4. The plants that were going to the analysed, in the region of Odessa had to be chosen.

Results:

1. The Ukrainian host welcomed the beginning of our project.
2. We recieved the promise of complete support for our purpose.
3. A principal mandate has been verbalized.
4. The plants that were going to be analysed have been chosen:
   - Water purification plant (liquid chlorine storage) in Odessa – catchment area of the Dnestr.
   - Mineral oil storage, pipeline route and transhipment facility in the harbour area – Black Sea.
   - Mineral oil storage in the catchment area of the Danube.
5. A plant, for which a cross-functional emergency plan has been elaborated, was chosen. For this matter, a plant with a high accident risk potential is most suitable.

Chosen plant:

- Water purification plant in Saroki (Moldavia)

Here we found many cross-border connections.

6. During consultations, a law for plant safety (implementation of the Seveso-II-Guideline) has been delivered to the Ukraine. This law is going to be translated into German, so that a comparison with the EU laws is possible.
7. It has been requested to translate the German Sample-VAwS into Russian, so that the Ukrainians can get an idea of the German law system.
8. The plant checks named under number 4 was going to be performed within the months August/September.
9. The next seminar with representatives from German companies was going to be organised in October 2002.

21.2 Seminar in Odessa, Oct. 14 – Oct. 15, 2002

Objective target of the consultation:

1. Presenting the method of plant checks and the evaluation of concrete plant inspections of an oil storage facility, an oil harbour and a water purification plant. The short-term, mid-term and long-term measures were going to be discussed here, using some practical examples.
2. Discussions about the experience with using the plant check method, for the improvement and further development of the plant.
3. Knowledge transfer on the topics water protection alert plans, average precaution within the frame of IKSE, flood protection and leakage monitoring.

Results:

1. Within the framework of the project “Technology Transfer for Plant-Related Water Protection in Romania, Moldavia and the Ukraine“, the first step was to analyse the chosen plant in the region of Odessa, in the catchment area of the Dnestr, to its water protection features and see which technical and organisational measures have to be taken.
2. All participants agreed that the used checklist method is very suitable for plant checks and that this method will increase the safety level in the participating countries, in the future.
3. The checklists can be used as a guide for plant checks, by, for example, the authority inspectors. If after analysing the plant we realise that the recommendations are not being followed, the checklists are immediately giving new recommendations, e.g. which measures have to be taken to achieve the aim of water protection.

4. It has to be proved how easy this method can be included in the structure of the law system for the implementation of the Seveso-Guideline, in the hosting country.
5. It has to be proved if the external disaster safety planning couldn't be developed further, so that it can develop recommendations for the warning and alert plan for the river Dnestr.
6. Inspectors who evaluate dangerous plants should be included in this matter, more often. These inspectors should be trained this method within a special seminar.
7. Another target should be to implement this method not only in the Ukraine, but in all Danube bordering countries.

21.3 Seminar in Ushgorod, August 21 and 22, 2003

Objective target of the consultation:

1. Presenting the method of plant checks and evaluating concrete plant inspections, at a cardboard production plant, a forest chemistry plant and the compressor station of a natural gas pipeline route. The short-term, mid-term and long-term measures were going to be discussed here, using some practical examples.
2. Discussions about the experience with using the plant check method, for the improvement and further development of the plant
3. Presentation and discussion about a cross-border, cross-functional emergency plan.
4. Informations about experiences of the international relation, in the Danube catchment area.

Results:

1. One highlight of our seminar was the presentation of the cross-functional, cross-border emergency plan. Here we concluded that the existing warning and alert systems have a big delay, until they warn downstream areas. Important time passes, time that is necessary for the fast implementation of countermeasures.
2. The consequence of this fact was the recommendation of purchasing a warning and alert system with a main warning unit, according to the Danube example.

21.4 Seminar in Dnepropetrowsk, June 10 and 11, 2004

Objective target of the consultation:

Main target of the workshop was presenting the state of affairs of the project and the presentation of the following steps of the purpose “Technology Transfer for Plant-Related Water Protection in Romania, Moldavia and the Ukraine“.

Results:

1. The task of the last 2 years was the implementation and testing of the checklist method on each 3 plants in the regions Odessa and Transcarpatia.
2. All participants agreed that the used checklist method is very suitable for plant checks and that this method will increase the safety level in the participating countries, in the future.
3. To establish this concept as a good working examination method, we developed a guide that should help the national inspectors accommodate with the checklist method.
4. Furthermore, a cross-functional and cross-border emergency plan, which can be used for other regions and plants, as well, has been elaborated with the help of the local authorities.
5. In fall, last year, we organised a seminar which was meant to be an informational trip, for the understanding of the ecological and technological safety system of the Federal Republic of Germany. The work of the German authorities, as well as the state of the art if various plants have been presented to our guests from the Ukraine, Moldavia and Armenia.

21.5 Seminar in Yalta, Sept. 13 – Sept. 15, 2004

Objective target of the consultation:

Main target of the workshop was presenting the state of affairs of the project and the presentation of the following steps of the purpose “Technology Transfer for Plant-Related Water Protection in Romania, Moldavia and the Ukraine“.

Results:

1. Target of the last 3 years was to implement and test the checklist method in each 3 plants in the regions Odessa, Transcarpatia and Dnepropetrowsk.
2. All participants agreed that the used checklist method is very suitable for plant checks and that this method will increase the safety level in the participating countries, in the future.

3. After the positive experiences gained during the implementation of the project and the positive feedback from Romania, we recommended passing on the seminar's resolution to the ministries in the Ukraine and Moldavia, with the recommendation to include the checklist method in the national law system.
4. Within the working group number 3, but also several times during the discussions of the seminar, the wish has been verbalize to organize more seminars for the national inspectors, where they are trained how to include the checklist method in their daily work.
5. For the ascertainment of the general laws for the accident prevention, in view of plant-related water protection, we recommended a regulation for the protection of ground and surface water, from plants handling substances related to water.
6. The implementation of the regulation recommendation is being proved by Ukrainian institutions. The Ukrainian Ministry of Environment is going to give a statement of this.
7. The elaborated sample safety report with the plant-related alert and danger precaution plan, whose structure and content is given by the Seveso-II-Guideline, is a great draft for the elaboration of safety reports in the Ukraine.
8. The participants at the workshop rated the results of the project as positive and stated that the project "Technology Transfer for Plant-Related Water Protection in Romania, Moldavia and the Ukraine“ is an important contribution to the strong international cooperation in this important field, between all participating countries.
9. To underline the result of the project, a document has been signed by representatives from all participating countries.

22 Presenting the Results at International Conferences

Targt of this step of the project: Presenting the project at international conferences.

An important aim for us was to not only make our project public in the hosting country but also internationally. So that R+D took part at the following international conferences and meetings and presented the results of the project:

1. Workshop on the Facilitation of the Exchange of Safety Management Systems and Safety Technologies, Chisinau (Moldavia), November 4-5, 2002
2. Follow-up-seminar THE SUBREGIONAL SEMINAR "INDUSTRIAL SAFETY AND HAZARD PREVENTION AT TRANSBOUNDARY RIVERS"-International Cooperation between Ukraine, Moldavia and Romania – July 25-27, 2003 in Chisinau (Moldavia)
3. THE SECOND SUBREGIONAL SEMINAR "INDUSTRIAL SAFETY AND HAZARD PREVENTION AT TRANSBOUNDARY RIVERS" -International Cooperation between Ukraine, Moldova and Romania – March 24 - 27, 2004 in Iasi (Romania)
4. Training seminar for the plant-related water protection and cross-functional accident management, April 20-22, 2004, in Tiblissi (Georgia) within the framework of the BMU/UBA project for the development of the supra national cooperation for accident preventions in the catchment area of the river Kura
5. Consultation of theUNECE/ JEG in Budapest, October 26, 2004
6. Consultative Seminar „Accidental Risk Potential in the Black Sea Region“, in Odessa, November 25– 26, 2004

23 Elaborating Internet Presentations and other Presentations on This Matter

Target of this step of the project: Presenting the project online, in written and spoken form, to promote the project results

To reach a large audience, we chose more ways to present the results of our project:

23.1 Internet Presentations

Our project website, www.rdumweltschutz.de/themen has been built at the beginning of the project and continuously updated. The available languages are English, Russian and German. From the main page, you can access the links: Targets, Background, Results, Important Documents, Contacts, etc.

Result of this step of the project: Elaborated website.

23.2 Newsletters

Two times a year we issue a newsletter in the languages English, Russian and German. These newsletters have been sent, via e-mail, to all contacts in our data base and some of then have been handed out, in printed form, during the seminars. The newsletter could always be read directly on our site, under www.rdumweltschutz.de/themen .

Result of this step of the project: The newsletters are to be found under /Newsletter/.

23.3 Publications

With the cooperationg of UBA, we elaborated several drafts for press releases. In 2002 an article has been published in the magazine „Danube Watch“.

In September 2003 and July 2004 the Ukrainian professional magazine „Technopolis“ issued an article about our project, as well.

Results of this step of the project: Articles are to be found under /Publications/.

23.4 Miscellaneous

During the Second International Exhibition-Forum, Environment-2004 and the All-Ukrainian Environmental Conference, from May 27-28, 2004, in Kiev, Mr. Vodolaskow from the Ukrainian Ministry of Environment presented our project and its aims. Mr. Vodolaskow underlined the positive feedback on his speech.

In the second part of the year 2004, R+D gave an interview, via telephone, to the German radio in the Ukraine. Hereby we presented the project, its tasks and results.

24 Summary

24.1 Background

Background of the project was the fact that the technological and organisational level of plant safety in East European countries is not as developed as the EU-standards require it. These deficits have already lead to major environmental accidents or they could lead to short or long term natural disasters, in these countries.

To remove the lacks in the safety standards of the East European countries, we initiated the project “Technology Transfer for Plant-Related Water Protection in Romania, Moldavia and the Ukraine“. The main target of this project is to increase the safety standard in the field of plant-related water protection. The professional and institutional management of the project has been taken over, in Germany by the Federal Environment Agency and in the Ukraine by the Ministry of Environment, in cooperation with the Government Office.

The principal item of the project was the elaboration of a simple and clearly structured method for water analysis, in view of the safety of ground and surface water, adapting to the economical and technological possibilities in the participating countries. Based on international recommendations, e.g. the Joint River Bodies, we elaborated the so called Checklist Method.

To train the implementation of this method together with the regional representatives from authorities and industry, plants in the regions Odessa, Transcarpatia and Dnepropetrowsk have been identified, examined with the checklist method and analysed on potential or acute risks.

The numerous discussions between the local authorities, the representatives from the plants that were analysed and the leaders of the national environment protection company Rizikon, have helped us continuously improve and develop further the checklist method.

24.2 Results

The checklist method is a big help for the systematic and structured plant check, with various aspects of the safety related examination and evaluation of water protection related plants.

The method contains both checklist for relevant plant units, like sealing systems, over-fill safety, transhipment of substances hazardous to water, pipeline safety, waste water streams, storage facilities and equipment of tanks and organisational concepts for the whole plant, like fire fight concept, aspects for the joint storage, plant monitoring, as well as plant alert and risk precaution planning. The risk aspects of substances are being evaluated in the Checklist „Substances Hazardous to Water“, the specific requirements for flood endangered areas will be found in the checklist “Requirements for plants in flood risk areas”.

The deficits of the checked plants are perceived objectively and without lacks. On the basis of these deficits, we elaborated measure catalogues, with short, mid and long-term measures for the improvement of the safety level of the plants. The so called “low cost” measures for increasing the safety level are privileged.

To unify the application of the checklist method, we elaborated an action guide, which contains both requirement details and practical guidelines for the strategy of examinating and evaluating of plants handling substances hazardous to water.

During the 3 performed trainings, the checklist method has been presented to a big number of local and regional inspectors. The effectiveness and the comparability of the safety examinations, by the local inspectors, can be increased thanks to the checklists.

The participants saw this method as an aid for the implementation of many national and international regulations.

During the training, the participants also learned how elaborate a sample safety report, according to the Seveso-II-Guideline of the EU, based of the inspection of a sample plant.

Safety lacks in plants handling substances hazardous to water, usually do not represent only a national, but a supra national danger. To assure an effective and fast alerting and to guarantee a high protection, according to the EU standards, a cross-border emergency plan has been elaborated, with the cooperation of the regional authorities and using a real plant, as an example. This emergency plan is a case sample for a supra national emergency organisation and can be transmitted to other plants.

Another relevant result of the project is a recommendation for the regulation for the protection of ground and surface water, especially for the Ukraine.

Indispensable for the success of the project was a varied communication of the project's contents and results. A number of seminars, consultations and trainings, as well as internet presentations, flyers, articles in the media have helped this matter. By participating at various international meetings, the project, together with the gained experience, could be presented to other international commissions.