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The need for training in the metal recycling industry

International Conference on Control and Management of
inadvertent Radioactive Material in Scrap Metal

Tarragona, February 2009



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An approach to the Argentinean context



An approach to the Argentinean context

General information

Population (2006, million):	39
Population Density (2006):	14.0
Surface (Continental area, Km2)	2.791.810
Organized by federal provinces	
Part of MERCOSUR	





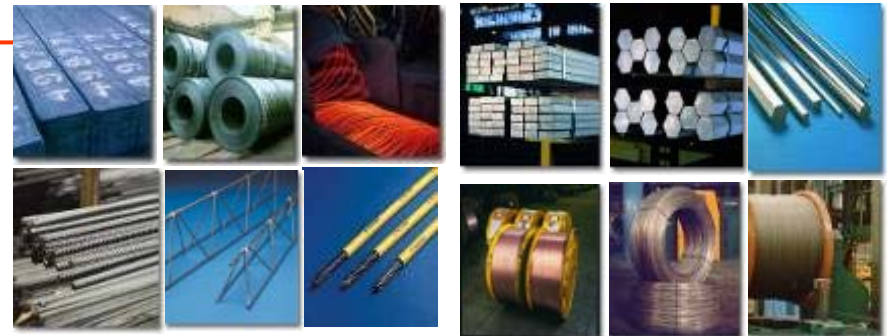
Acindar's presentation



- Acindar is a steelmaking company formed by private capitals.
- It's operations started in 1942, with a plant in Rosario (Santa Fe).
- Today it is the biggest private producer of non-flat steels in Argentina, with a market share of more than 50%.
- It produces more than 200 product lines for different markets.
- It employs approximately 3000 people and has more than 10 productive facilities in Argentina.
- It has a steel production capacity of 1.400.000 ton./year. In 2008, 1.372.000 tons of crude steel were produced.
- ArcelorMittal is the steel producing leader worldwide, with a capacity of 110M tons, 10% of the world's production.

Product Families

- Construction
- Industry
- Merchant Bars & Sections
- Wires





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Argentinean scrap market

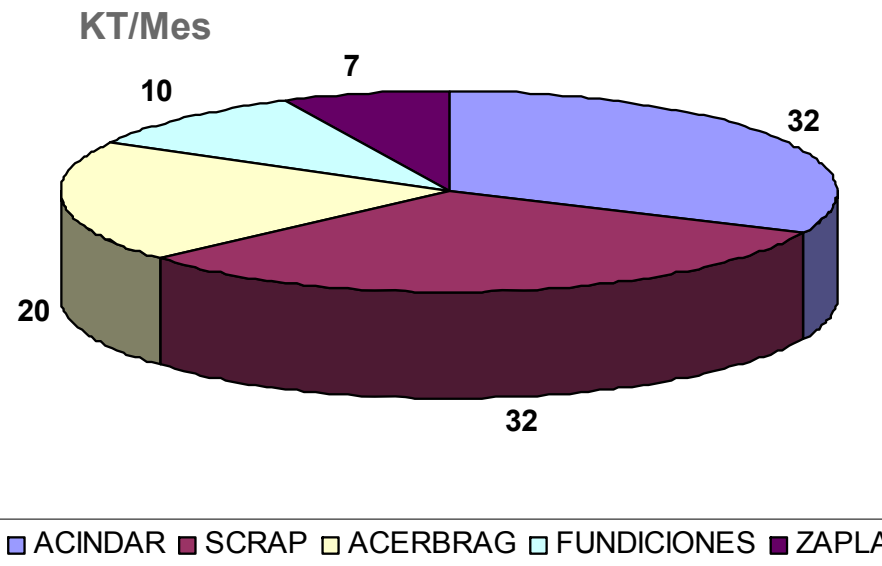


Argentina Scrap Market - Players



Total Market (est): **101.000 T/month**

	KT/M	%
ACINDAR	32	31,7
SCRAP	32	31,7
ACERBRAG	20	19,8
FOUNDRIES	10	9,9
ZAPLA	7	6,9
TOTAL	101	100



The importance of training



The importance of training



Learning

learning is a change in behaviour, based on experience. It is a fundamental factor in human behaviour given that it affects not only the way people think, feel and do, but also their beliefs, values and goals.

Goals of training and development

- To prepare collaborators for the execution of diverse tasks and responsibilities in the organization.
- Integration and communication
- To enable continuous personal development.
- Full commitment
- To change collaborators attitude.
- Enhances collaborator's performance

The contents of the training course could involve 4 types of behavioural change:

- Data transmission
- Skills development
- Attitude change or development
- Concept development



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Integrated radioactivity detection system



From scratch

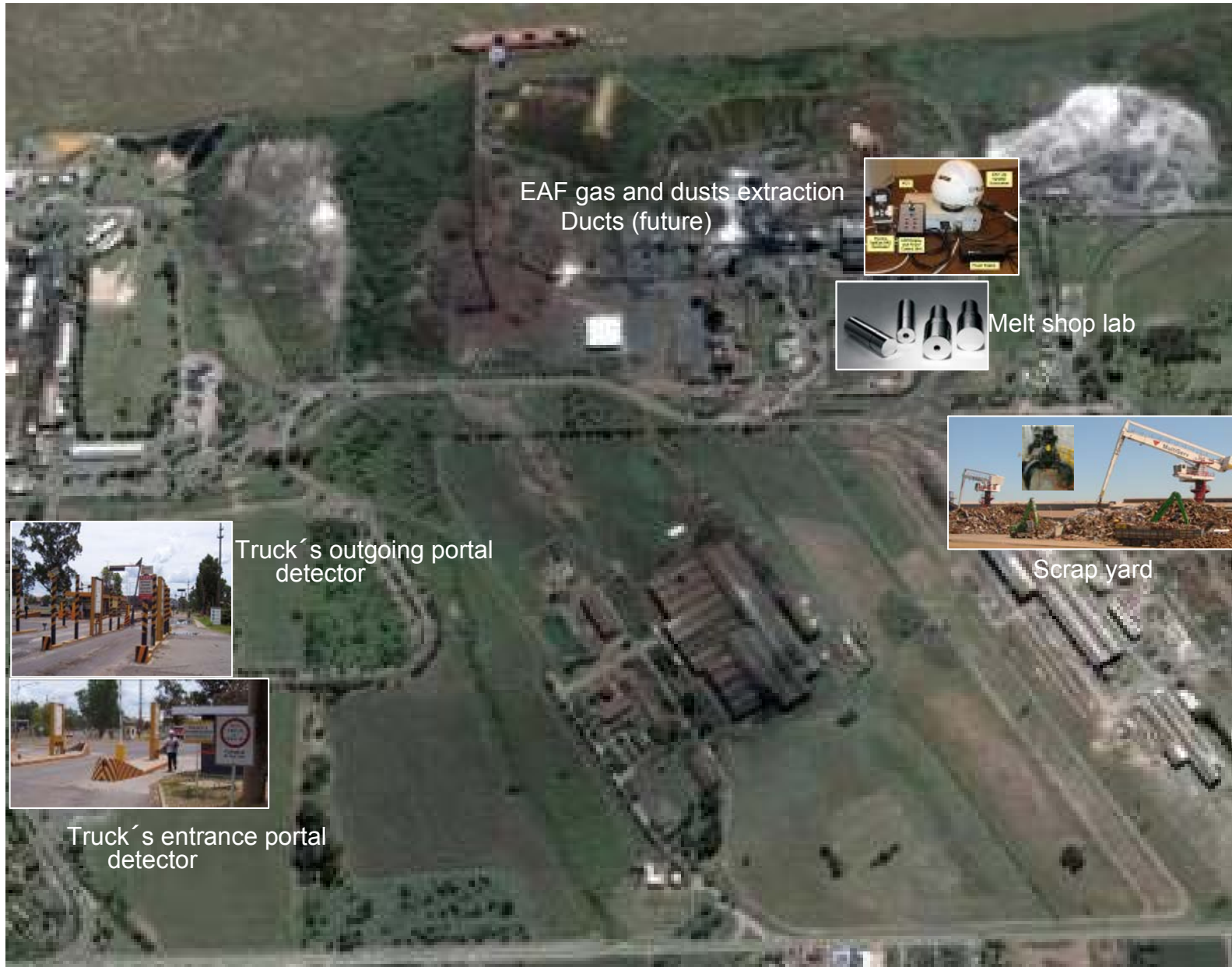


- Up to 2005, Acindar didn't have scrap checked for radioactivity.
- The National Regulatory Authority (**NRA**) proposed the development of a culture of prevention, discussing it in regular meetings about radioactive sources and incidents registered in other countries.
- Arcelor reference document regarding management of possible radioactively contaminated materials introduced by the metal scrap was issued.
- Reference Document from Arcelor Committee on Radioactivity (2004) was issued.
- It was necessary to control the incoming scrap for radioactive contamination and therefore a project is created to buy and install detection equipment.
- The decision to establish a high standard control system was made.
- This brought along the need to modify processes and scrap yard layout as well **as personnel training**.

First steps

- Advisory meetings with the Nuclear Regulatory Authority (NRA)
- Benchmark with other facilities within the ArcelorMittal group.
- Benchmark and advisory meetings with potential suppliers.
- Research and definition of the devices and system to be installed and its needs.
- **Basic training** in radiological safety of radioactive sources for:
 - Safety manager and technicians,
 - Meltshop Manager and Maintenance coordinator,
 - Calibration lab chief and supervisor,
 - Project engineer,
 - Environmental engineer.
- **Specific formation** on radiological safety for use of industrial meters for:
 - Safety manager and technicians,
 - Meltshop Manager and Maintenance coordinator,
 - Calibration lab supervisor,

Evolution



Entrance portal detector

- Big scintillation plastic detectors installed vertically at each side of the gate that translate radioactive energy into light pulses with truck movement detector.



- Data processing unit:
 - Radiation above the established limit level
 - Truck speed if higher than 5mph
 - Variations in the calibration of natural background level
 - Vehicle stopped






What Went Well



- Technical personnel trained by the supplier
- Maintenance plan
- Consults and diagnosis on the phone
- General and specific control, operation and emergency procedure definition.
- Equipment calibration routine.

Experiences

Situations	What we did																																																																																											
Alternate incoming gate for trucks without detection portal	A barrier with padlock was installed and the signals were improved to make the system less vulnerable.	 <table border="1"> <thead> <tr> <th>Alarma</th> <th>Sirena</th> <th>Baliza</th> <th>Imprime ticket</th> <th>Acción a seguir</th> <th>Riesgo Potencial</th> </tr> </thead> <tbody> <tr> <td>Escaneado Dinámico</td> <td>SI</td> <td>SI</td> <td>SI</td> <td>PGSEG-054</td> <td>Alto</td> </tr> <tr> <td>De Fondo Alto</td> <td>SI</td> <td>SI</td> <td>SI</td> <td>Llamar a L.C. ó E.S.G. Dilec</td> <td>Medio</td> </tr> <tr> <td>Tasa de conteo Alto</td> <td>SI</td> <td>SI</td> <td>SI</td> <td>Llamar a L.C. ó E.S.G. Dilec</td> <td>Medio</td> </tr> <tr> <td>Velocidad excesiva</td> <td>NO</td> <td>NO</td> <td>NO</td> <td>PGSEG-054</td> <td>Alto</td> </tr> <tr> <td>Vehículo Parado</td> <td>NO</td> <td>NO</td> <td>NO</td> <td>Esperar 30' y pasar el camión nuevamente</td> <td>Medio</td> </tr> <tr> <td>Tasa de conteo Bajo</td> <td>NO</td> <td>NO</td> <td>NO</td> <td>Llamar al L.C. ó E.S.G. Dilec</td> <td>Alto</td> </tr> </tbody> </table>	Alarma	Sirena	Baliza	Imprime ticket	Acción a seguir	Riesgo Potencial	Escaneado Dinámico	SI	SI	SI	PGSEG-054	Alto	De Fondo Alto	SI	SI	SI	Llamar a L.C. ó E.S.G. Dilec	Medio	Tasa de conteo Alto	SI	SI	SI	Llamar a L.C. ó E.S.G. Dilec	Medio	Velocidad excesiva	NO	NO	NO	PGSEG-054	Alto	Vehículo Parado	NO	NO	NO	Esperar 30' y pasar el camión nuevamente	Medio	Tasa de conteo Bajo	NO	NO	NO	Llamar al L.C. ó E.S.G. Dilec	Alto																																																
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Lack of training of the security personnel	Personnel was trained and handbook handed out. On the job training.																																																																																											
Lack of procedure in case of portal failure	Included in the general safety procedure. Manual meter and dosimeter were bought.																																																																																											
Stop functioning in case of blackout	A battery was installed to guarantee the energy income.																																																																																											
Alarm for NORM perforation materials	Material is separated, revised and levels are measured and informed to the NRA.																																																																																											
Alarm for refractory materials	Samples were taken in 20 trucks with refractory material to establish a reference value for this load type.																																																																																											
Oxygen supplier's trucks have a source that caused real alarms	The source was identified and security personnel was informed.																																																																																											
Real alarm with no vehicle on the portal	After a thorough investigation a contractor was discovered doing a gammagraphy in a duct 300m away from the portal.	 <table border="1"> <thead> <tr> <th>Fecha</th> <th>Porcentaje</th> <th>Camion</th> <th>Acoplado</th> <th>Transporte</th> <th>Carga</th> </tr> </thead> <tbody> <tr> <td>07/12/2005</td> <td>78%</td> <td>XXXXXXXXXX</td> <td>XXXXXXXXXX</td> <td>El Canerio</td> <td>Refractario</td> </tr> <tr> <td>18/12/2005</td> <td>47%</td> <td>VER228</td> <td>AN 742</td> <td>Rigabasso</td> <td>Refractario</td> </tr> <tr> <td>24/12/2006</td> <td>99%</td> <td>FJF211</td> <td>FGK484</td> <td>RHI</td> <td>Refractario</td> </tr> <tr> <td>26/01/2007</td> <td>75%</td> <td>RXX251</td> <td>FRM463</td> <td>RHI</td> <td>Refractario</td> </tr> <tr> <td>27/01/2007</td> <td>72%</td> <td>XXXXXXXXXX</td> <td>XXXXXXXXXX</td> <td>RHI</td> <td>Refractario</td> </tr> <tr> <td>27/01/2007</td> <td>64%</td> <td>FAB318</td> <td>QFP080</td> <td>RHI</td> <td>Refractario</td> </tr> <tr> <td>21/02/2007</td> <td>198%</td> <td>GCZ902</td> <td>DOV397</td> <td>Vesulus</td> <td>Refractario</td> </tr> <tr> <td>22/02/2007</td> <td>75%</td> <td>IDL1959</td> <td>IFV2222</td> <td>Rigabasso</td> <td>Refractario</td> </tr> <tr> <td>26/02/2007</td> <td>79%</td> <td>DYM191</td> <td>CHE051</td> <td>Rigabasso</td> <td>Refractario</td> </tr> <tr> <td>28/02/2007</td> <td>24%</td> <td>OVN319</td> <td>BWC918</td> <td>El Tero</td> <td>Refractario</td> </tr> <tr> <td>09/03/2007</td> <td>55%</td> <td>EHJ972</td> <td>EEO617</td> <td>Rigabasso</td> <td>Refractario</td> </tr> <tr> <td>17/03/2007</td> <td>158%</td> <td>CLZ902</td> <td>BZH423</td> <td>El Tero</td> <td>Refractario</td> </tr> <tr> <td>09/04/2007</td> <td>22%</td> <td>BWY901</td> <td>XXXXXXXXXX</td> <td>El Tero</td> <td>Refractario</td> </tr> <tr> <td>09/04/2007</td> <td>67%</td> <td>FLB916</td> <td>XXXXXXXXXX</td> <td>Rigabasso</td> <td>Refractario</td> </tr> </tbody> </table>	Fecha	Porcentaje	Camion	Acoplado	Transporte	Carga	07/12/2005	78%	XXXXXXXXXX	XXXXXXXXXX	El Canerio	Refractario	18/12/2005	47%	VER228	AN 742	Rigabasso	Refractario	24/12/2006	99%	FJF211	FGK484	RHI	Refractario	26/01/2007	75%	RXX251	FRM463	RHI	Refractario	27/01/2007	72%	XXXXXXXXXX	XXXXXXXXXX	RHI	Refractario	27/01/2007	64%	FAB318	QFP080	RHI	Refractario	21/02/2007	198%	GCZ902	DOV397	Vesulus	Refractario	22/02/2007	75%	IDL1959	IFV2222	Rigabasso	Refractario	26/02/2007	79%	DYM191	CHE051	Rigabasso	Refractario	28/02/2007	24%	OVN319	BWC918	El Tero	Refractario	09/03/2007	55%	EHJ972	EEO617	Rigabasso	Refractario	17/03/2007	158%	CLZ902	BZH423	El Tero	Refractario	09/04/2007	22%	BWY901	XXXXXXXXXX	El Tero	Refractario	09/04/2007	67%	FLB916	XXXXXXXXXX	Rigabasso	Refractario
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Experiences

- Equipment sensitivity
- NRA consult and update of general and emergency procedures. Involved personnel training.
- Event detection software development (driver, plates).
- Alarm administration software (notices)
- Social responsibility (supplier's material control)
- Background information gathered as backup for the decision to install a detection portal.
- Additional training for safety technicians, doctors and melt shop project engineer.
- Continuous casting personnel awareness.




Scrap yard detector



- The scrap yard operation is carried out by Multiserv, so their personnel was trained.
- Acindar's notification was included in their procedures in case of alarm and the need to isolate the potentially contaminated material.

Experiences

Situation	What we did	
The scrap yard was relocated and the operation handed out to a contractor	New operations were defined and new general and emergency procedures were created.	
Lack of training in new contractor's personnel	Personnel trained and handbooks handed out. On the job training.	
Unit mounted on a mobile structure, doesn't allow continuous energy	A battery RF equipment was installed, daily recharged.	

The crane operator has the percentile background radioactivity level detected by the equipment.

It is possible to program prenotice levels and detection alarms that the equipment uses to inform the operator any detections. If the maximum level is detected, a DANGER window will be displayed and a sound alarm will trigger.



Lab detector

The system has 2 basic components:

- a - two iodize sodium scintillation detectors (NaI),
- c - multichannel radioactivity analyzer.

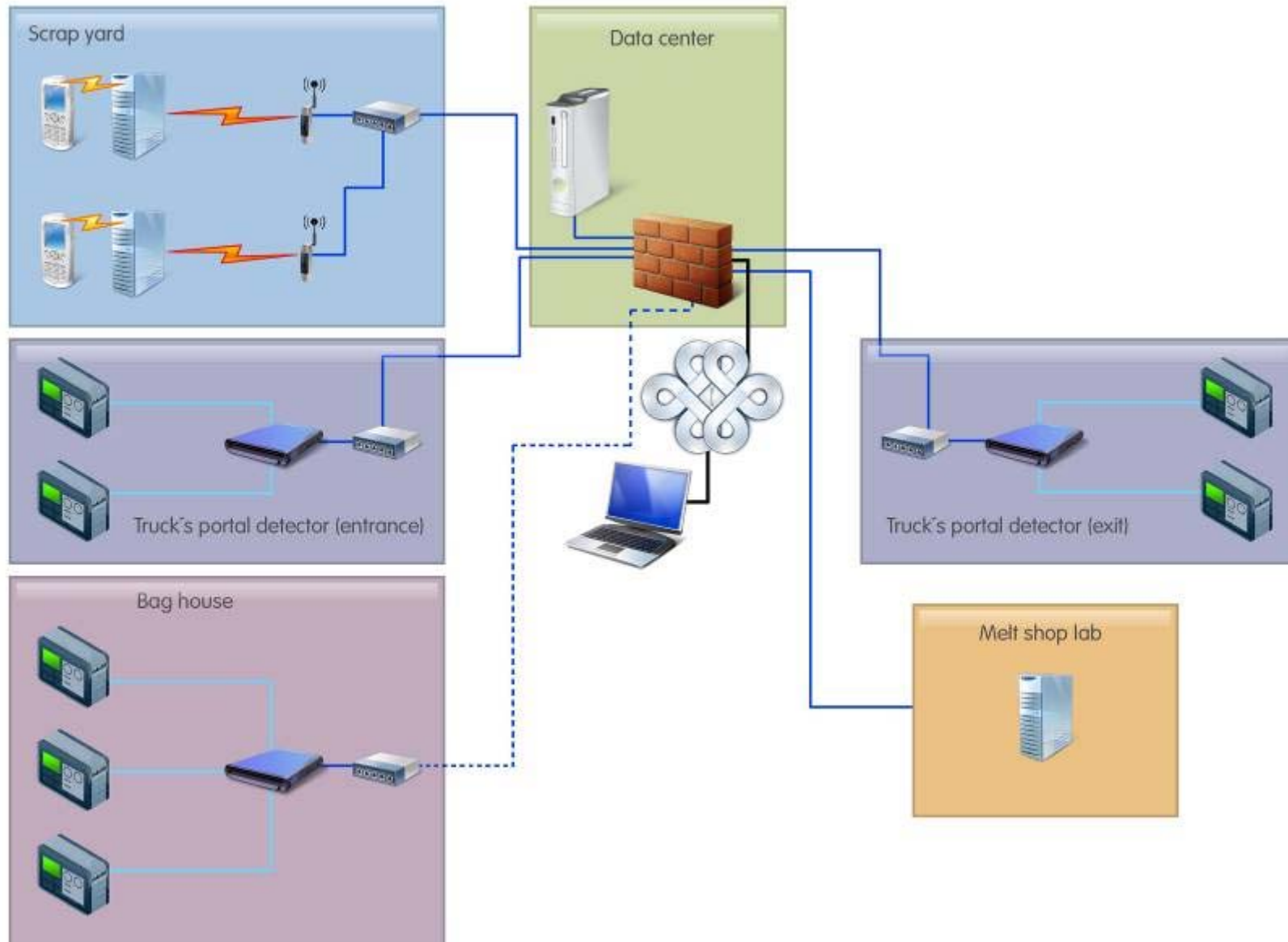
Data analysis and alarms are done locally by lab personnel.



Situation	What we did
Lack of knowledge and experience	Basic training with Supplier, extra specific training, consults to supplier.
Record data storage necessity	Connection of the equipment to SAP
Definition of the necessary test pattern	Studies and prototypes to define the most appropriate pattern.



Integrated network





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Next steps



Our goal



- To create a work group -at a national level- liderated by the N.R.A. to establish common norms and procedures of radiological safety with the objective of sustaining an appropriate level of people's and environment protection, achieving full commitment to this preventive culture.

“It is not enough to have knowledge, one must also apply it.”
To achieve a knowledge and experiences exchange on a permanent basis to help unify criteria.

It is not enough to have wishes, one must also accomplish.”

- To establish awareness needs of the principal players involved in the scrap handling process.
Johann Wolfgang von Goethe
- To work together, recyclers, recuperators, Custom, gatherers, governments and Non Governmentalist Organizations (NGOs).
- To achieve general awareness of the importance of this issue.



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THANK YOU FOR YOUR ATENTION