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TRAINING PROJECT



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OPERATOR CERTIFICATION RESULTS IN IMPROVED OPERATIONS AND COST EFFICIENCY

Presentation to:

Arab Water Week

Cost Recovery at water and wastewater utilities
Achievements, Challenges and Solutions

December 5-9, 2010, Amman, Jordan



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Presenter

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As Water and Wastewater professionals, we seek to:

- Safeguard Public Health
- Protect the Environment
- Conserve Resources for Future Generations
- Sustain Infrastructure Investments
- Optimize the Costs of Operation
- Provide Affordable Services
- Contribute to Water Resources Management



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But we cannot do this alone....

- We rely on many people to achieve these goals including the people who work in the:
 - Water treatment plants
 - Wastewater treatment plants
 - Water distribution and wastewater collection networks
 - Laboratories



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Our challenge as managers is to ensure that these people perform their jobs well – a challenge on many fronts:

- Establishing standard operating procedures
- Developing the skills and knowledge of staff so that they follow procedures effectively
- Making sure that staff can apply their skills and knowledge

Sometimes it is difficult to meet this challenge



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Perspective

- We invest millions in infrastructure
- Operators are the key to maintaining the infrastructure and having it perform up to capacity
- Yet our training of operators is often haphazard and our investment in them is often minimal



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With full Acceptance by the WWSST, the OMT in Jordan, is designed to meet the challenge with its Operator Certification approach:

- Standard O&M procedures
- Training matched to O&M procedures and
- Competent staff through standardized training
- Testing to verify skills and knowledge
- Certification process to verify skills and knowledge
- Enhanced capacity of local training planners, developers and providers
- Serving demand for O&M training services in Jordan and the region on a commercially sustainable basis



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OMT Objective - To improve water and wastewater worker and organizational O&M performance

- **Duration:** May 2008 – September 2012
52 months
- **Prime Contractor:** Chemonics International Inc.
- **Partner Firms:**
 - Jordan: Engicon
Interdisciplinary Research Consultants
 - US: CH2M Hill
Delaware Technical & Community College



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WWSST Objective – Providing AQAC with the Sectoral Technical expertise (Developing criteria, Procedures, Instructions and recommending certificate issuance)

- **Established:** May 2010
- **Affiliation:** The technical arm of the Center for Accreditation and Quality Assurance/ E-TVET Council
- **Representation:** Private Sector > 50%,
Public Sector
W/WW Operators
Utilities
Academia
Environment



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What does it mean to be an Operator?

- Anyone who has direct “hands-on” responsibility for a process that safeguards public health and the environment

Not an Operator:

- A person who does not have direct responsibility to safeguard public health and the environment
- A person whose duties do not include actual operation or supervision of systems and operators
- Workers such as welders, carpenters, truck drivers, and the like



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Operator Certification Benefits – to the Utility

- Improved Operating Results and Compliance with regulations
- Better customer service
- Improved safety and reduced accident rates
- Enhanced Employee Retention
- Way to link Recruitment, Hiring and Promotion with Compensation/Salaries and Incentives and motivate people



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Operator Certification Benefits – to the Utility

- Reliable way for managers to know that staff are well-qualified to perform their jobs according to SOP
- Standardized and accountable approach for meeting training needs
- Operating improvements often lead to sustainability of infrastructure and improved financial performance



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Operator Certification Benefits – to the Individual

- Establishes a Profession of which workers can be proud
- Workers earning the Recognition and Respect of co-workers, managers, customers, the public and family members
- Improved safety and reduced accident rates
- Enhanced Career Opportunities and Retention
- Way to earn higher levels of compensation



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Does Certification Work?

- Wadi Ma'in Water Treatment Plant in Jordan
 - 30 staff members passed ABC/USA operator certification examinations
 - Water produced meets Jordanian standards – World Health Organization as well as United States Environmental Protection Agency
 - Success inspired USAID support for the Jordan OMT Project



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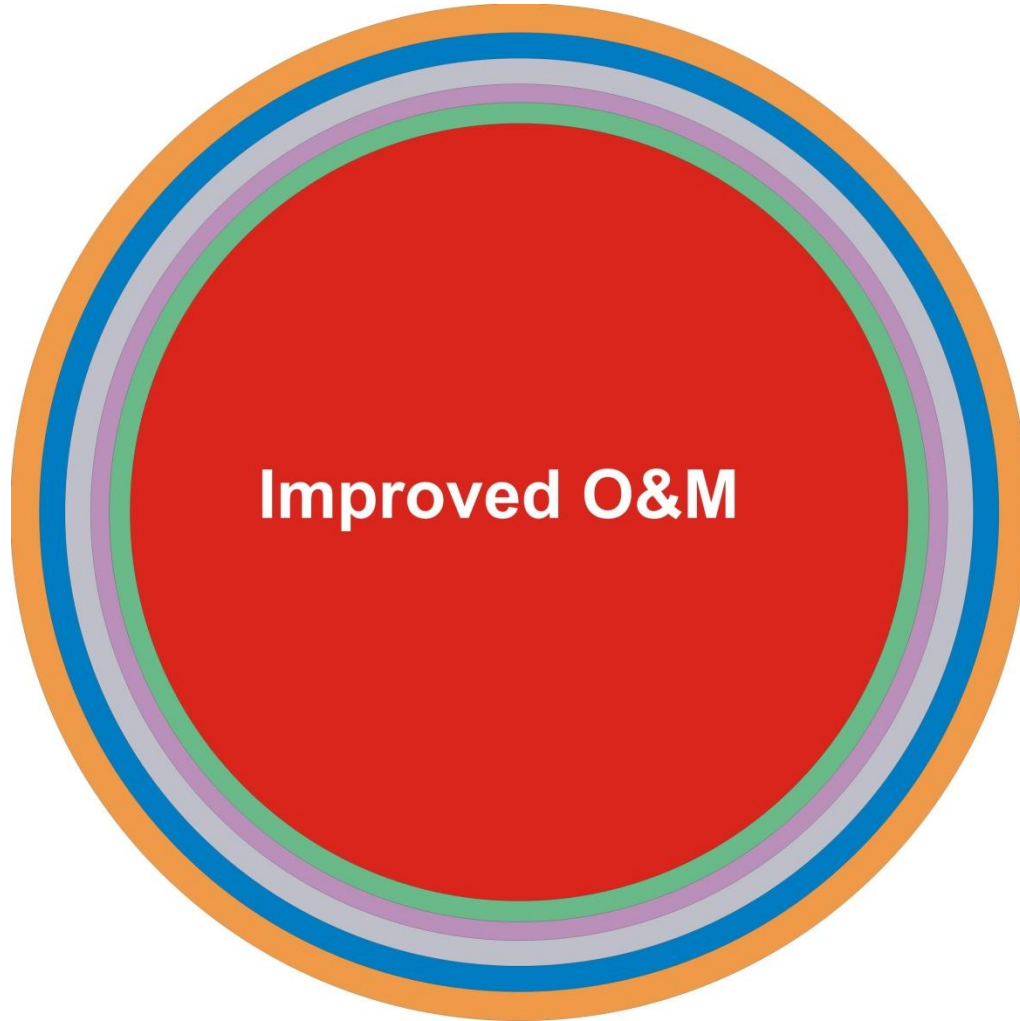
What does an Operator Certification Program Involve?



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Goal

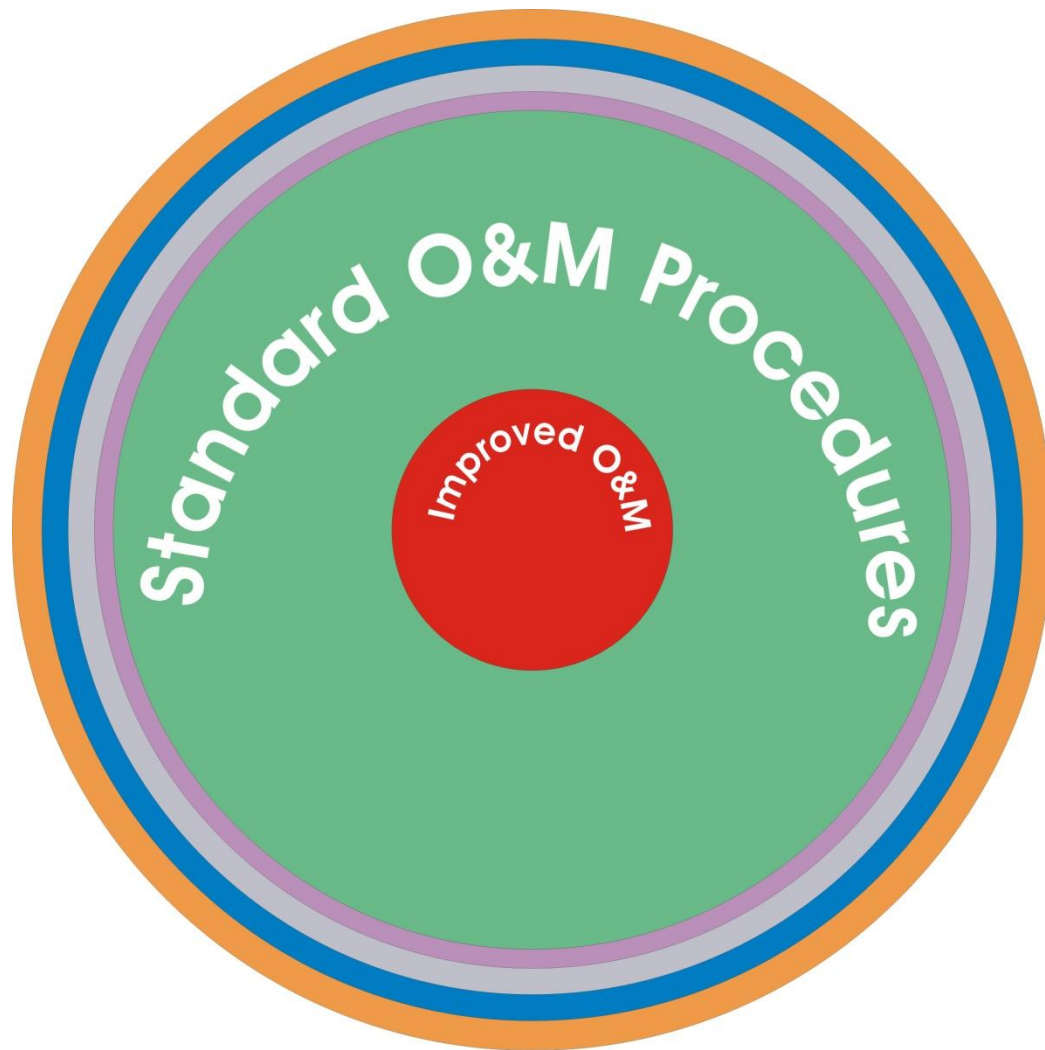




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Step 1





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Standard O&M Procedures to:

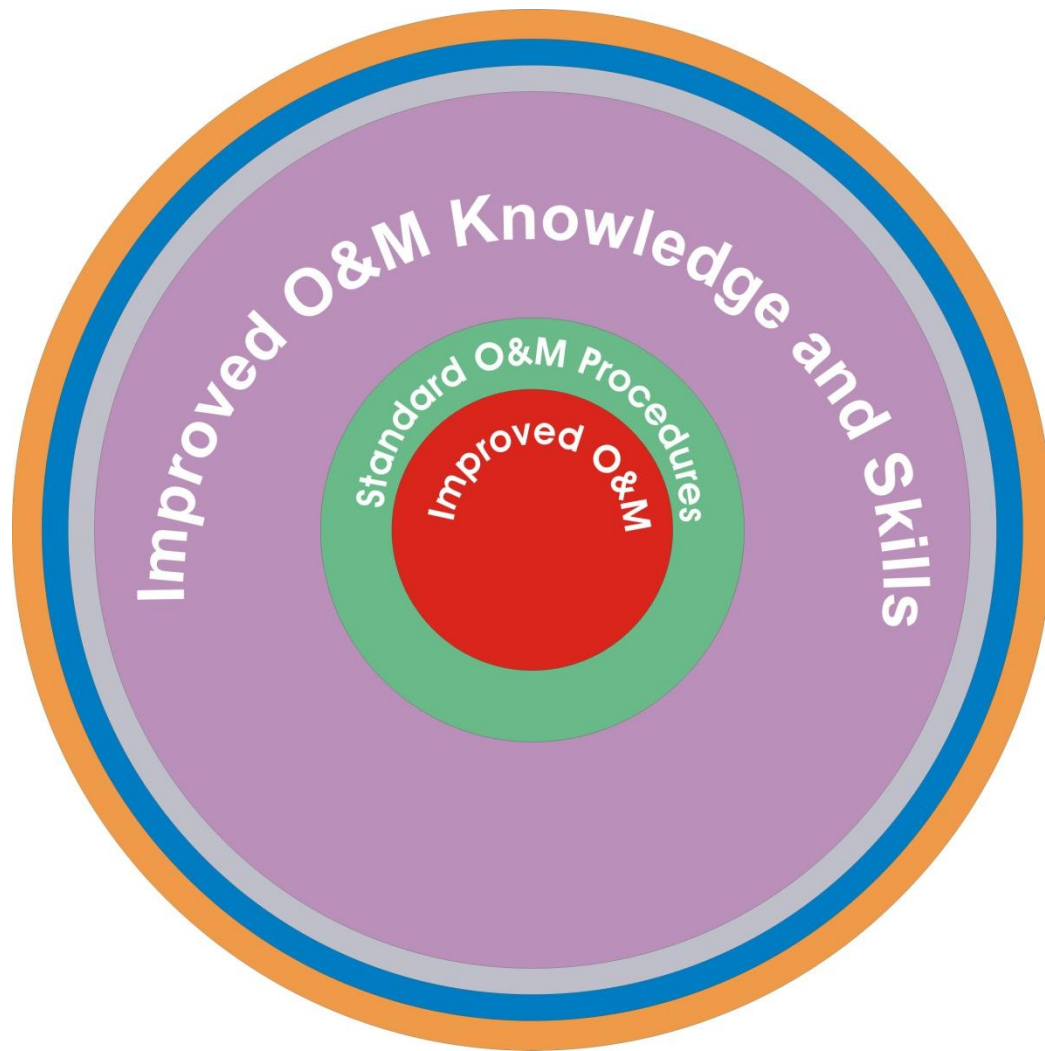
- Evaluate **Incoming** Water/Wastewater Characteristics
- Monitor, Evaluate and Adjust Treatment **Processes**
- Inspect and Maintain **Equipment**
- Operate **Equipment**
- Collect Samples and Interpret **Laboratory** Analyses
- Comply with Drinking Water / Environmental **Regulations**
- Perform Security, **Safety and Administrative** Procedures



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Step 2





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O&M Knowledge & Skills

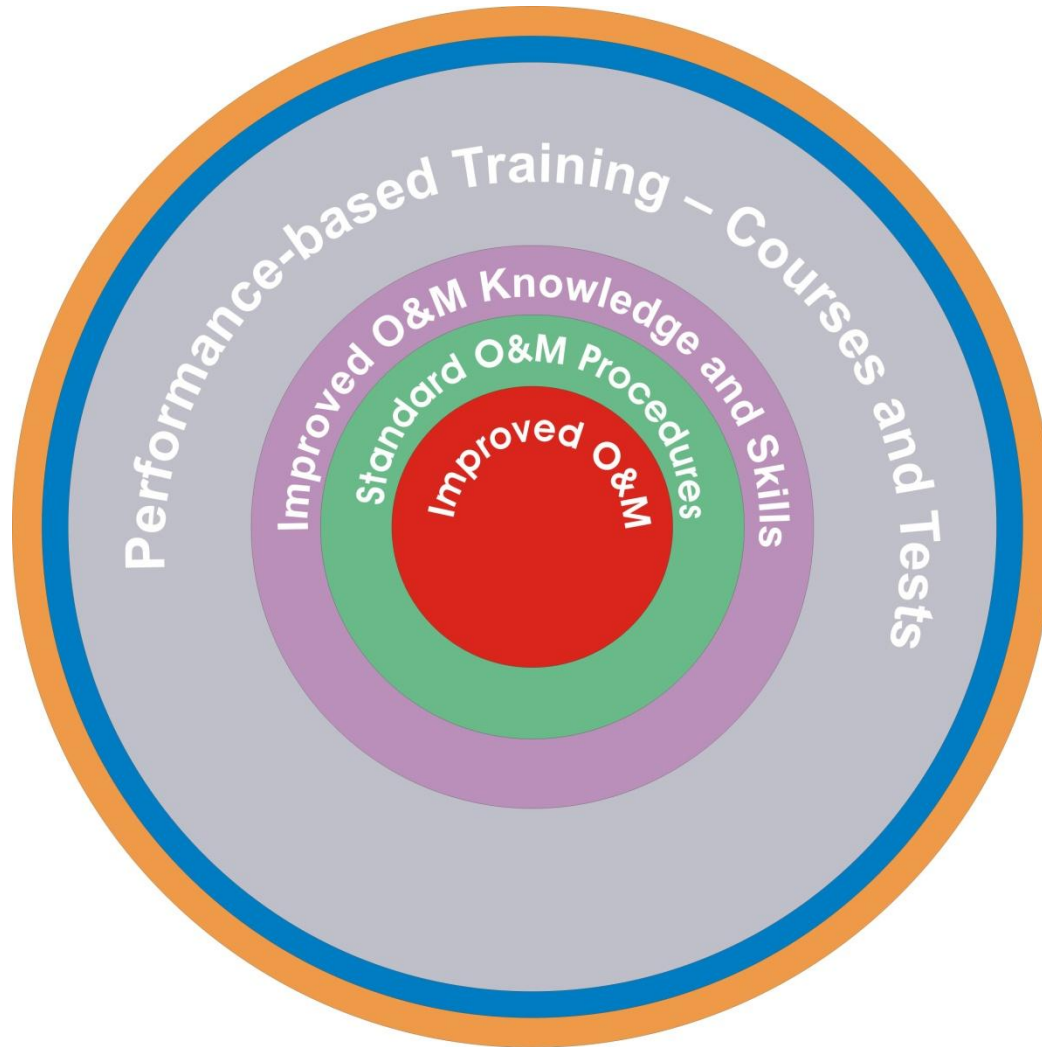
- Analyze Standard Operating and Maintenance Procedures (SOMPs) and other Best Practices References
- Assess Performance-based Training Needs
 - O&M Skills: What do operators **need to do** on the job?
 - O&M Knowledge: What do operators **need to know** to do their job?



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Step 3





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Performance-based Training

- O&M Curricula: directly link Training Content with Industry Standards and SOMP
- O&M Courses: delivery of appropriate difficulty level and learning methods
- O&M Tests – Secure, confidential tests to effectively and fairly evaluate trainee learning



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Jordanian Resources

- 38 Courses **in Arabic** based on California State University at Sacramento materials and adapted to local needs
- Testing **in Arabic** based on Association of Boards of Certification standards (ABC)
- Certified Local Trainers – Certified Operators who have completed a Training-of-Trainer program

Jordan is preparing to serve its operators as well as those in the region



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Water Operator Certification Program

#	Training Module	Training Hours by Level							
		Level I		Level II		Level III		Level IV	
		I Hr.*	Act.**	I Hr.	Act.	I Hr.	Act.	I Hr.	Act.
1	Water Treatment Operator	2	---	---	---	---	---	---	---
2	Treatment Plant Operation	10	---	4	---	---	---	---	---
3	Safety	4	---	---	---	---	---	---	---
4	Water Sources and Intake Structures	2	---	4	---	3	---	---	---
5	Coagulation, Flocculation & Sedimentation	3	---	6	---	6	---	4	---
6	Filtration	3	---	5	---	2	---	3	---
7	Disinfection	4	---	4	1	4	---	4	---
8	Laboratory Procedures	3	5	---	---	---	---	---	---
9	Process Wastes	2	---	2	---	---	---	---	---
10	Reverse Osmosis	3	---	3	---	5	1	2	---
11	Taste and Odor	4	---	2	1	3	---	3	---
12	Iron and Manganese Control	2	---	3	---	2	1	1	---
13	Corrosion Control	1	---	1	---	2	---	3	1
14	Water Softening	3	---	3	---	3	2	---	---
15	Management	---	---	---	---	6	3	9	4
Total		46	5	37	2	36	7	29	5



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Wastewater Operator Certification Program

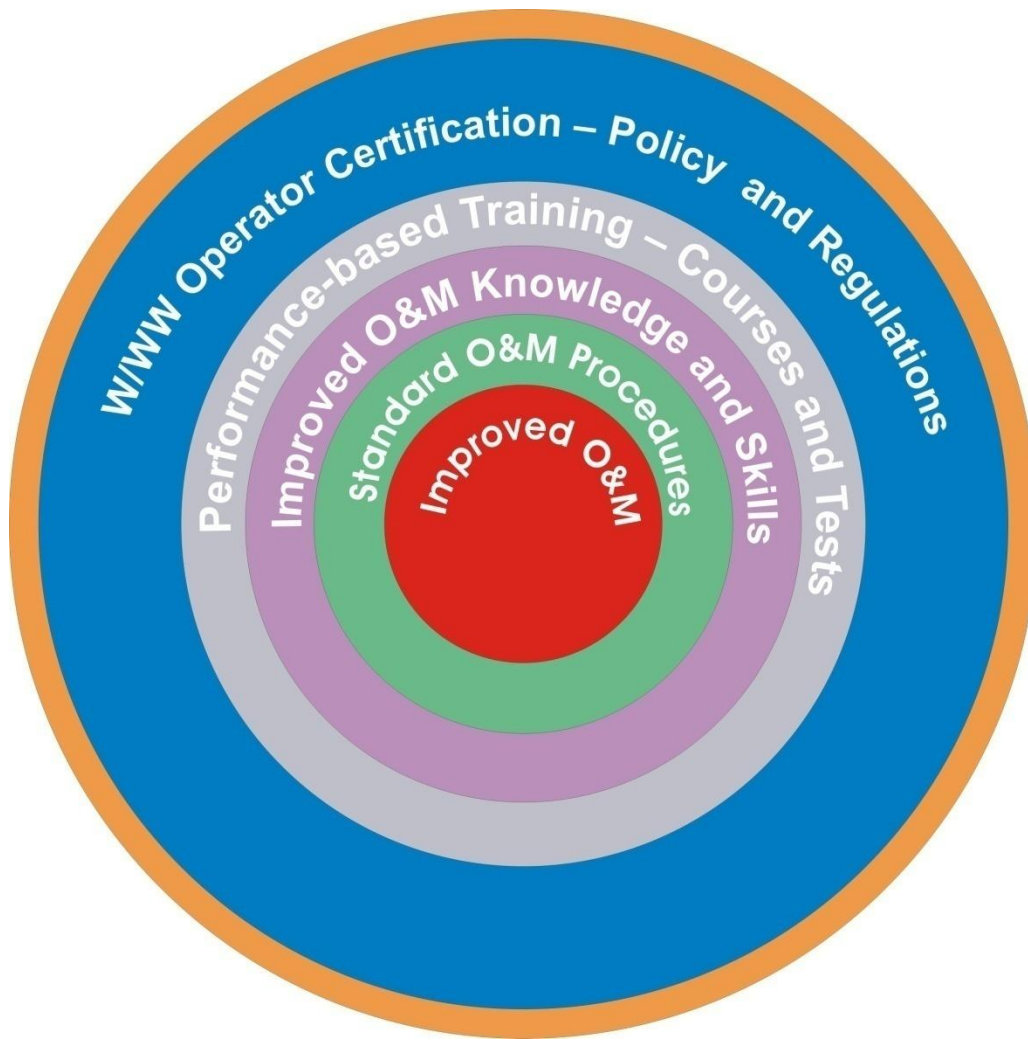
#	Training Module	Training Hours by Level							
		Level I		Level II		Level III		Level IV	
		I Hr*	Act.**	I Hr	Act.	I Hr	Act.	I Hr	Act.
1	Wastewater Operator	1	---	---	---	---	---	---	---
2	Why Treat Waste	3	---	2	---	1	---	---	---
3	Wastewater Treatment Facilities	5	2	3	---	2	---	---	---
4	Microbiology	---	---	---	---	3	---	---	---
5	Racks, Screens and Grit Removal	4	---	2	---	2	---	---	---
6	Sedimentation and Flotation	3	---	2	---	2	---	---	---
7	Fixed Film Technology	---	---	3	---	3	---	---	---
8	Waste Treatment Ponds	4	---	2	---	2	---	---	---
9	Activated Sludge	4	---	4	---	3	---	---	---
10	Disinfection and Chlorination	4	2	3	1	3	1	---	---
11	Sludge Digestion and Solids Handling	5	1	4	1	5	1	---	---
12	Reuse of Treated Effluent	2	---	---	---	---	---	---	---
13	Laboratory and Basic Chemistry	2	3	5	4	5	3	---	---
14	Maintenance	3	2	3	2	---	---	---	---
15	Plant Safety	4	2	2	1	2	1	---	---
16	Management, Public Relations, and Budget & Finance	---	---	---	---	---	---	6	4
17	Reports & Recordkeeping Systems, Training, and Safety	---	---	---	---	---	---	2	2
18	Pollution Prevention	---	---	---	---	---	---	2	---
19	Oder Control	---	---	---	---	---	---	4	---
20	Nitrogen & Phosphorus/Nutrient Removal	---	---	---	---	---	---	8	---
21	Troubleshooting I	---	---	---	---	---	---	6	---
22	Troubleshooting II	---	---	---	---	---	---	6	---
23	Industrial Waste Treatment	---	---	---	---	---	---	12	2
	Total	44	12	35	9	33	6	46	8



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Step 4





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Operator Certification Process Policy and Regulation Components

- Classifications and Qualification Standards
 - Education
 - Experience
- Testing requirement: every operator to pass comprehensive, job-based, certification exams
- Certificates of Competency issued by recognized and respected agency



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Earning Certification – the Technician’s Career Path

General Secondary Diploma

Level	Education	Experience	DRC
Operator-in-Training *	General Secondary Education Certificate or equivalent	1 year	N/A
1. Basic - Entry	General Secondary Education Certificate or equivalent	1 year as Operator-in-Training	N/A
2. Intermediate A - Skilled	General Secondary Education Certificate or equivalent + 40 Training Hours	3 years at Level 1	N/A
3. Intermediate B - Supervisor	General Secondary Education Certificate or equivalent + 120 Training Hours	6 years at Level 2	2 years

DRC – Direct Responsible Charge



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Earning Certification – the Engineer’s Career Path

Level	Education	Experience	DRC
Operator-in-Training	First University Degree	0 year	N/A
1. Basic - Entry	First University Degree	0 year	N/A
2. Intermediate A - Skilled	First University Degree	0 years at Level 1	N/A
3. Intermediate B - Supervisor	First University Degree + 30 Training Hours	2 years at Level 2	2 years
4. Advanced - Manager	First University Degree + 50 Training Hours	3 years at Level 3	2 years

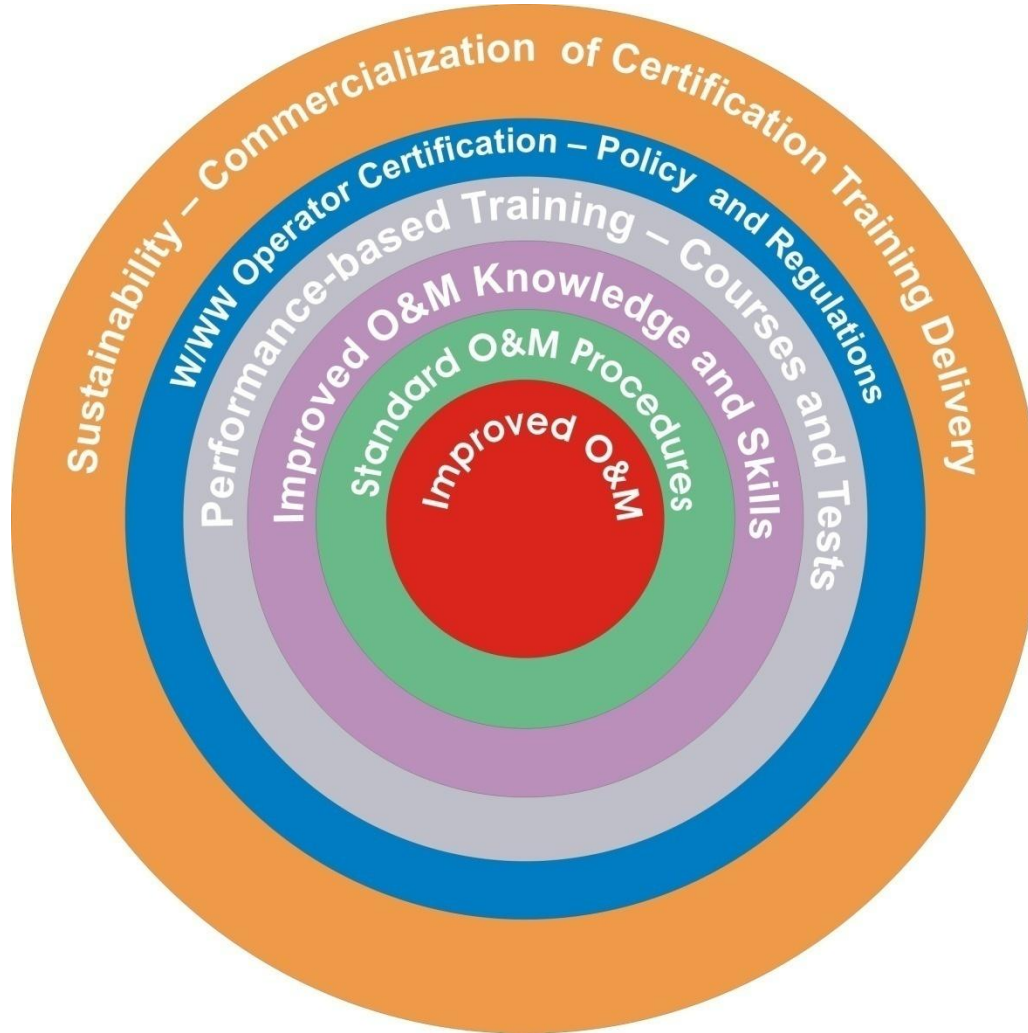
DRC – Direct Responsible Charge



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Step 5





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Sustainability

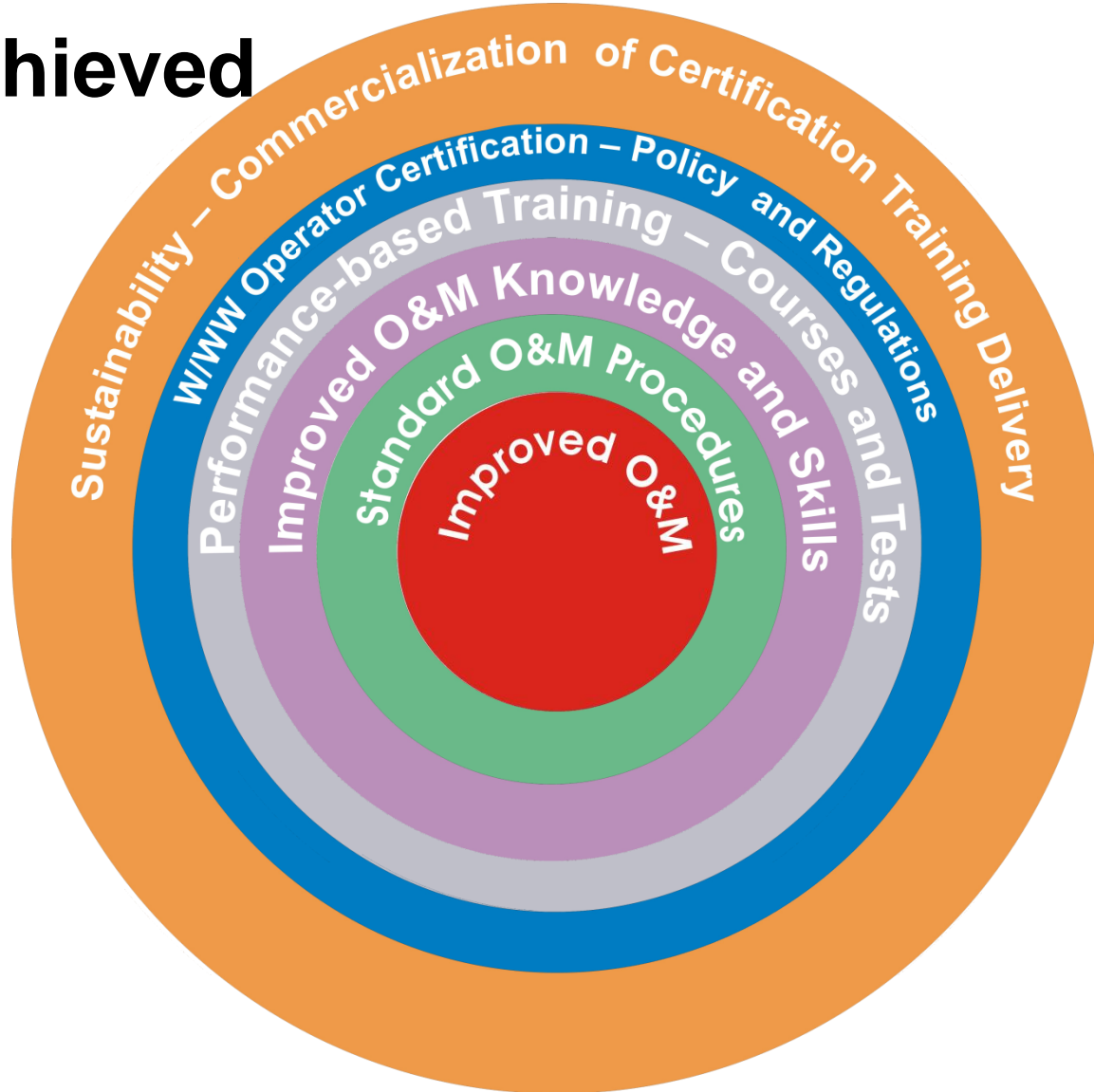
- Operator Certification Policy & Regulation creates Demand for training
- High quality Training Materials and professional local Trainers (who must be certified operators) ensure effective Learning
- Fee Structure generates revenues required to Sustain the Certification System
- Effective Marketing supplies the national and regional demand for certification training



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Goal Achieved





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Jordanian Certification Framework



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- Authority
 - Employment, Technical and Vocational Education and Training (E-TVET) Council; Law No. 46 of 2008, Article 11
 - Water Authority Law No. 18 of 1988 and its amendments
- Mandate
 - All municipal, industrial and private water/wastewater treatment and networks shall be operated by people who possess qualifications and certificates specified by the Jordan Water/Wastewater Operator Certification Program

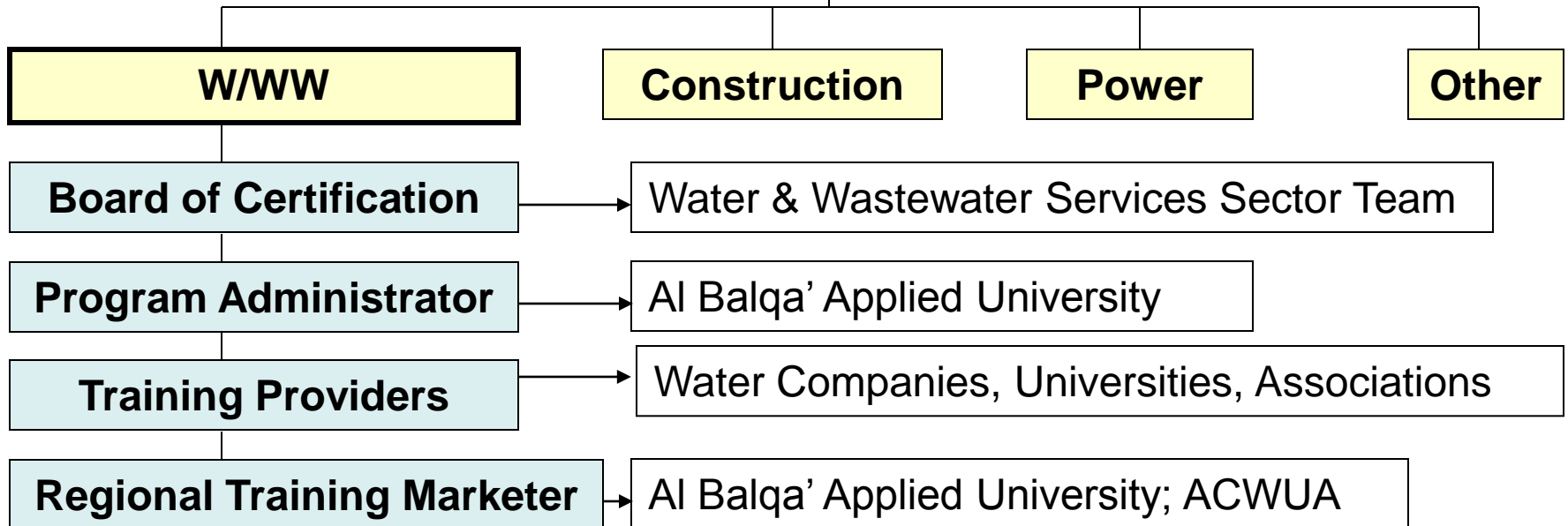


Institutional Structure

Certification Body

Center for Accreditation and Quality Assurance
(*E-TVET Council*)

Sectors





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Certification Body – Accreditation and Quality Assurance Center / E-TVET Council

- Accreditation – Regulation, Criteria (ISO 17024), Assessment, Award
- Certification - Issue Operator Certificates (Engineers & Technicians)
- Quality Assurance - Evaluation of Material, Tests, Trainers, Practices

Board of Certification – W/WW Services Sector Team

- Program Scheme, Policies, and Operating Instructions
- Technical Standards and Training Content
- Program Management and Financial Oversight
- Affiliations – ABC (Association of Boards of Certification - USA)



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Program Administrator – Al Balqa’ Applied University

- Day-to-Day Program and Financial Management
- Training Scheduling & Administration - Management Information
- Testing Services – Secure Test Administration, Grading, Reporting
- Contracting - Training Providers: Trainers, Developers
- Local Program Marketing - Jordan W/WW Sector
- Liaise with Regional Training Marketer (RTM)

Training Providers – Jordanian Water Companies; Private Sector; Associations; Universities

- Course Instruction
- Course/Test Development and Revision
- Training of Trainers; Training of Training Specialists



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Certification Program Marketing

- Partners
 - Arab Countries Water utilities Association
 - Al Balqa' Applied University
- Conduct Market Surveys in Arabic Language Countries
- Advertise Certification Program Services – training, testing and certification
- Coordinate among:
 - Training customers
 - Program Administrator
 - Training providers



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Questions and Answers