



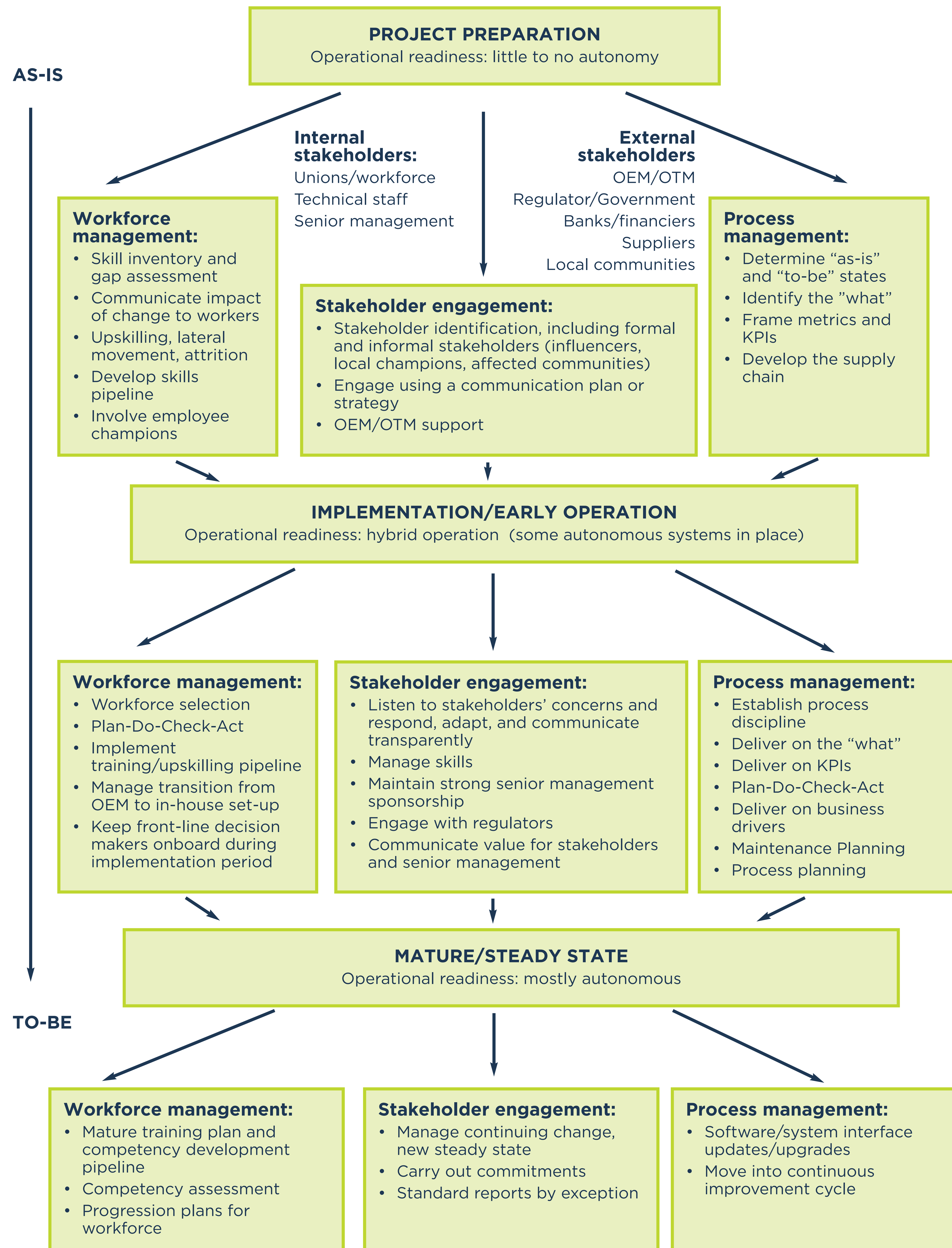
AUTONOMOUS MINING WORKING GROUP

IMPLEMENTATION OF AUTONOMOUS SYSTEMS

This guideline is a universal roadmap for mining automation and integration that prepares companies to readily and effectively adopt and integrate systems and new technologies. It aims to prevent patchwork implementation processes that cause misaligned systems to hamper effective communication.

PARTICIPATING COMPANIES

3D-P, ABB, ACCENTURE, AMAZON, ANGLO AMERICAN, ANGLOGOLD ASHANTI, ARIGAL, AUSTROBOTS, AUTONOMOUS SOLUTIONS, BARRICK GOLD, BESTECH, BHP, CAPSTONE MINING CORP, CATERPILLAR, CEMI, CHECKMARK CONSULTING, CITIC PACIFIC MINING, DASSAULT SYSTEMES, DE BEERS, DEPARTMENT OF MINES AND PETROLEUM (DMP), EPIROC, ERDENES MONGOL LLC, ETF MINING EQUIPMENT, FLOW PARTNERS, FORTESCUE METALS GROUP (FMG), FOSTERGY, FREEPORT-MCMORAN, GOLD FIELDS, GOLDCORP, GOVERNMENT OF ALBERTA, HARD-LINE, HATCH, HEXAGON MINING, ICONO ADVISORY, IMAGOSOFT, IMPERIAL OIL, ITI SOLUTIONS, JVA, KINROSS GOLD, KOMATSU, LIEBHERR, MACLEAN ENGINEERING, MAPTEK, MCKINSEY, METS IGNITED, MINEOPOLY PTY, MINERA YANACOCHA, MINISTRY OF ENERGY AND MINES, MODULAR MINING SYSTEMS, MOHAMMED 6 POLYTECHNIC UNIVERSITY, MOSAIC, MST GLOBAL, MTGA, NEVSUN RESOURCES LTD, NEWMONT, NIOSH, NUTRIEN, OFF WORLD, OP3 CONSULTING PTY, ORICA, OSISOFT, PECK TECH, PROUDFOOT CONSULTING, QUEEN'S UNIVERSITY, RCT, REAL IRM, RIGID ROBOTICS, RIO TINTO, ROCKWELL AUTOMATION, ROY HILL, SANDVIK, SIBANYE-STILLWATER, SIEMENS, SKYMINEUAV, SMART SYSTEMS GROUP, SMS EQUIPMENT, SSR MINING, STRATA WORLDWIDE, SUNCOR, SYMBIOTIC INNOVATIONS, SYNCRUDE, TECK, THIESS, TOREX GOLD, TRIMBLE, UNIVERSITY OF ALBERTA, UNIVERSITY OF BRITISH COLUMBIA, UNIVERSITY OF QUEENSLAND, UPTAKE, VIRTUAL BUSINESS LINKS, VIST GROUP, WHITEHAVEN COAL, YOURPACE



Also covered in this guideline...

- **CHANGE MANAGEMENT**
- **OTHER USEFUL DOCUMENTS**
- **BUSINESS CASE**
 - Systemic Change Considerations
 - People
 - Processes
 - Benefits and Costs
 - Value Drivers
 - Costs
 - Strategic Fit
 - Communication with Stakeholders
 - Risks
 - Other Considerations
 - Evolution
 - Case Studies
- **HEALTH AND SAFETY**
 - Safety Plan
 - Hazard Identification
 - Risk Analysis
 - Risk Evaluation and Management
 - Monitoring and Review
 - Documentation
 - Information
 - Instruction
 - Training
 - Supervision
 - Hazard Controls
- **REGULATIONS**
 - Adapting Regulations to Autonomous Mining
 - Engaging Regulators
- **HUMAN AND COMMUNITY IMPACT**
 - Engagement Plan
 - Addressing job changes
 - Socioeconomic situation
 - Education
- **DEPLOYING AUTONOMOUS SYSTEMS**
 - Mine Planning and Design for Autonomous Systems
 - Physical Mine Planning and Design
 - System Infrastructure Planning and Design
 - Process Planning and Design
 - Planning and Designing for Maintenance
 - Hazard Controls
 - Engineering Design Framework
 - Configuration Management of Design and Planning Changes
 - Emergency management planning
 - Architecture
 - Business
 - Application
 - Data
 - Technology
 - Organizational Design
 - Commissioning