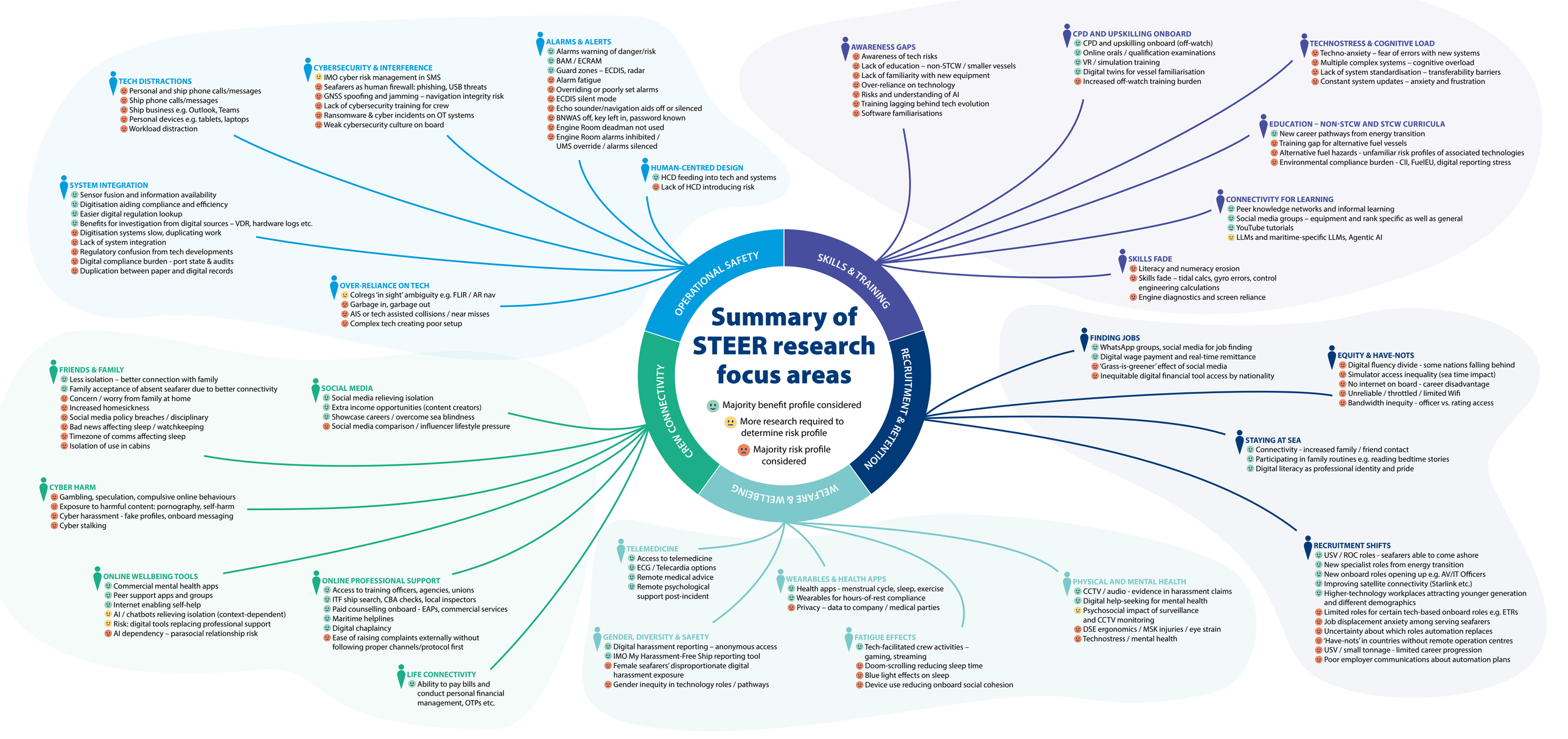

Summary of STEER research focus areas
Majority benefit profile considered
More research required to determine risk profile
Majority risk profile considered
OPERATIONAL SAFETY
SKILLS & TRAINING
RECRUITMENT & RETENTION
WELFARE & WELLBEING
CREW CONNECTIVITY
TECH DISTRACTIONS
Personal and ship phone calls/messages
Ship phone calls/messages
Ship business e.g. Outlook, Teams
Personal devices e.g. tablets, laptops
Workload distraction
CYBERSECURITY & INTERFERENCE
IMO cyber risk management in SMS
Seafarers as human firewall: phishing, USB threats
GNSS spoofing and jamming – navigation integrity risk
Lack of cybersecurity training for crew
Ransomware & cyber incidents on OT systems
Weak cybersecurity culture on board
ALARMS & ALERTS
Alarms warning of danger/risk
BAM / ECRAM
Guard zones – ECDIS, radar
Alarm fatigue
Overriding or poorly set alarms
ECDIS silent mode
Echo sounder/navigation aids off or silenced
BNWAS off, key left in, password known
Engine Room deadman not used
Engine Room alarms inhibited / UMS override / alarms silenced
HUMAN-CENTRED DESIGN
HCD feeding into tech and systems
Lack of HCD introducing risk
SYSTEM INTEGRATION
Sensor fusion and information availability
Digitisation aiding compliance and efficiency
Easier digital regulation lookup
Benefits for investigation from digital sources – VDR, hardware logs etc.
Digitisation systems slow, duplicating work
Lack of system integration
Regulatory confusion from tech developments
Digital compliance burden - port state & audits
Duplication between paper and digital records
OVER-RELIANCE ON TECH
Colregs 'in sight' ambiguity e.g. FLIR / AR nav
Garbage in, garbage out
AIS or tech assisted collisions / near misses
Complex tech creating poor setup
AWARENESS GAPS
Awareness of tech risks
Lack of education – non-STCW / smaller vessels
Lack of familiarity with new equipment
Over-reliance on technology
Risks and understanding of AI
Training lagging behind tech evolution
Software familiarisations
CPD AND UPSKILLING ONBOARD
CPD and upskilling onboard (off-watch)
Online orals / qualification examinations
VR / simulation training
Digital twins for vessel familiarisation
Increased off-watch training burden
TECHNOSTRESS & COGNITIVE LOAD
Techno-anxiety – fear of errors with new systems
Multiple complex systems – cognitive overload
Lack of system standardisation – transferability barriers
Constant system updates – anxiety and frustration
EDUCATION – NON-STCW AND STCW CURRICULA
New career pathways from energy transition
Training gap for alternative fuel vessels
Alternative fuel hazards - unfamiliar risk profiles of associated technologies
Environmental compliance burden - CII, FuelEU, digital reporting stress
CONNECTIVITY FOR LEARNING
Peer knowledge networks and informal learning
Social media groups – equipment and rank specific as well as general
YouTube tutorials
LLMs and maritime-specific LLMs, Agentic AI
SKILLS FADE
Literacy and numeracy erosion
Skills fade – tidal calcs, gyro errors, control engineering calculations
Engine diagnostics and screen reliance
FINDING JOBS
WhatsApp groups, social media for job finding
Digital wage payment and real-time remittance
'Grass-is-greener' effect of social media
Inequitable digital financial tool access by nationality
EQUITY & HAVE-NOTS
Digital fluency divide - some nations falling behind
Simulator access inequality (sea time impact)
No internet on board - career disadvantage
Unreliable / throttled / limited Wifi
Bandwidth inequity - officer vs. rating access
STAYING AT SEA
Connectivity - increased family / friend contact
Participating in family routines e.g. reading bedtime stories
Digital literacy as professional identity and pride
RECRUITMENT SHIFTS
USV / ROC roles - seafarers able to come ashore
New specialist roles from energy transition
New onboard roles opening up e.g. AV/IT Officers
Improving satellite connectivity (Starlink etc.)
Higher-technology workplaces attracting younger generation and different demographics
Limited roles for certain tech-based onboard roles e.g. ETRs
Job displacement anxiety among serving seafarers
Uncertainty about which roles automation replaces
'Have-nots' in countries without remote operation centres
USV / small tonnage - limited career progression
Poor employer communications about automation plans
FRIENDS & FAMILY
Less isolation – better connection with family
Family acceptance of absent seafarer due to better connectivity
Concern / worry from family at home
Increased homesickness
Social media policy breaches / disciplinary
Bad news affecting sleep / watchkeeping
Timezone of comms affecting sleep
Isolation of use in cabins
SOCIAL MEDIA
Social media relieving isolation
Extra income opportunities (content creators)
Showcase careers / overcome sea blindness
Social media comparison / influencer lifestyle pressure
CYBER HARM
Gambling, speculation, compulsive online behaviours
Exposure to harmful content: pornography, self-harm
Cyber harassment - fake profiles, onboard messaging
Cyber stalking
ONLINE WELLBEING TOOLS
Commercial mental health apps
Peer support apps and groups
Internet enabling self-help
AI / chatbots relieving isolation (context-dependent)
Risk: digital tools replacing professional support
AI dependency – parasocial relationship risk
ONLINE PROFESSIONAL SUPPORT
Access to training officers, agencies, unions
ITF ship search, CBA checks, local inspectors
Paid counselling onboard - EAPs, commercial services
Maritime helplines
Digital chaplaincy
Ease of raising complaints externally without following proper channels/protocol first
LIFE CONNECTIVITY
Ability to pay bills and conduct personal financial management, OTPs etc.
TELEMEDICINE
Access to telemedicine
ECG / Telecardia options
Remote medical advice
Remote psychological support post-incident
WEARABLES & HEALTH APPS
Health apps - menstrual cycle, sleep, exercise
Wearables for hours-of-rest compliance
Privacy – data to company / medical parties
GENDER, DIVERSITY & SAFETY
Digital harassment reporting – anonymous access
IMO My Harassment-Free Ship reporting tool
Female seafarers' disproportionate digital harassment exposure
Gender inequity in technology roles / pathways
FATIGUE EFFECTS
Tech-facilitated crew activities – gaming, streaming
Doom-scrolling reducing sleep time
Blue light effects on sleep
Device use reducing onboard social cohesion
PHYSICAL AND MENTAL HEALTH
CCTV / audio - evidence in harassment claims
Digital help-seeking for mental health
Psychosocial impact of surveillance and CCTV monitoring
DSE ergonomics / MSK injuries / eye strain
Technostress / mental health