Using monitoring info to inform training

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Overview

- Monitoring considerations
- So you have some data, what comes next?
- Workouts
  - Max Aerobic Power
- Race Analysis
  - Acceleration, Speed and Speed endurance ideas

Why Monitor

- Profile athletes
  - Know your client
- To assess adaptation
  - Systematic approach to training progression
- Educate
  - Race education
  - Pacing

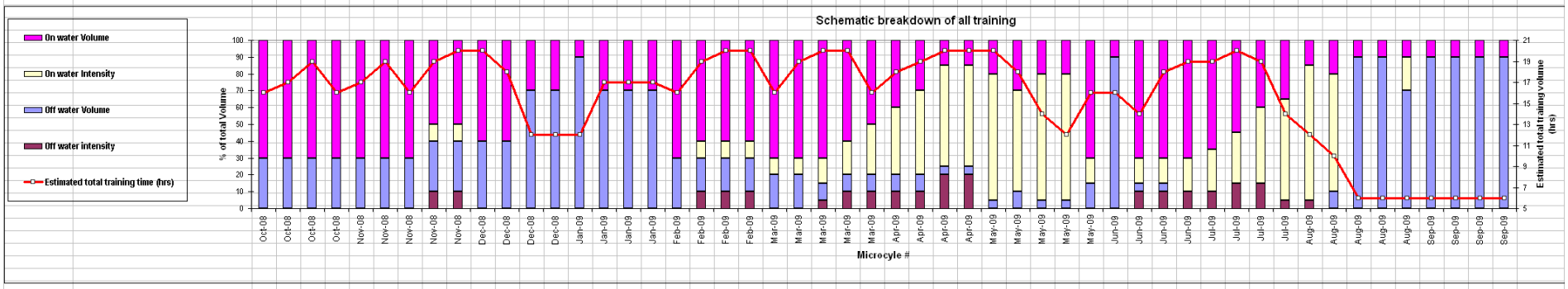
Important considerations

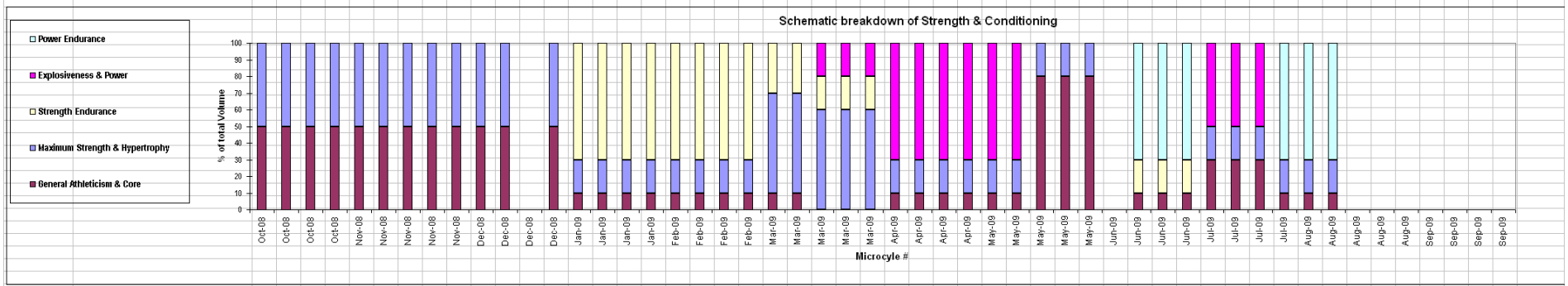
- Training status of the athlete
  - Training phase (career, quad, year)
- Test specificity and relevance
- Validity and reliability
- Performing the test (athlete / coach / tester)
  - Motivation, attention to detail
- Room for creativity
- Essential component of well rounded systematic approach
  - Plan-Execute-Review-Plan-Execute-review…

CKC Sn Team YTP (200m)

(Dated for 2009/2010)

Dates	Months	Oct-09				Nov-09					Dec-09				Jan-10				Feb-10				Mar-10					Apr-10				May-10				Jun-10				Jul-10					Aug-10				Sep-10			
	Week Date	05	12	19	26	02	09	16	23	30	07	14	21	28	04	11	18	25	01	08	15	22	01	08	15	22	29	05	12	19	26	03	10	17	24	31	07	14	21	28	05	12	19	26	02	09	16	23	30	06	13	20	27
Events	Traveling / Location						Florida												Florida																HUN/GER												GER/POL							
	Competitions																															VWC 1, 7-9 Vichy (FRA)		NT Trails # 1 15-18th		VWC 2, 28-30 Szeged (HUN)		VWC 3, 4-6 Duisburg (GER)						NT Trails # 2 17-18th						World Ser. 19-22 (POL)									
	Camps						Fall camp												Spring Training Camp																Eur Tour/camp							Summer camp						WCcamp							
Training	Macrocycle	General Preparation											R&R		Specific Basic				Specific									Competitive #1							Comp #2		R&R	Spec Race Prep	Competitive #3											Rest / Recovery							
	Mesocycle	1				2							3		4				5									6							7		7.1	8	9																	
	Microcycles	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
	wks to London 2012	147	146	145	144	143	142	141	140	139	138	137	136	135	134	133	132	131	130	129	128	127	126	125	124	123	122	121	120	119	118	117	116	115	114	113	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97	96
	IST meetings																																																				
Priorities	**GENERAL TRAINING**																																																			
1	On water Volume	70	70	70	70	70	70	70	50	50	60	60	30	30	10	30	30	30	70	60	60	60	70	70	70	60	50	40	30	15	15	20	30	20	20	70	10	70	70	70	65	55	40	35	15	20	10	10	10	10	10	10	10
2	On water Intensity	0	0	0	0	0	0	0	10	10	0	0	0	0	0	0	0	0	0	10	10	10	10	10	15	20	30	40	50	60	60	75	60	75	75	15	0	15	15	20	25	30	45	60	60	70	0	0	20	0	0	0	0
3	Off water Volume	30	30	30	30	30	30	30	30	30	40	40	70	70	90	70	70	70	30	20	20	20	20	20	10	10	10	10	10	5	5	5	10	5	5	15	90	5	5	0	0	0	0	0	0	10	90	90	70	90	90	90	90
	Off water intensity	0	0	0	0	0	0	0	10	10	0	0	0	0	0	0	0	0	0	10	10	10	0	0	5	10	10	10	10	20	20	0	0	0	0	0	0	10	10	10	10	15	15	5	5	0	0	0	0	0	0	0	0
	General Breakdown Warning (% Vol)																																																			
	Estimated paddling volume (km)	80	90	100	80	90	100	110	120	120	180	110	50	100					100	140	160	160	90	120	130	120	90	100	100	110	110	90	80	70	80	80	80	80	100	110	110	140	110	90	80	80	60	30	50	30	30	30	30
	Estimated total training time (hrs)	16	17	19	16	17	19	16	19	20	20	18	12	12	12	17	17	17	16	19	20	20	16	19	20	20	16	18	19	20	20	20	18	14	12	16	16	14	18	19	19	20	19	14	12	10	6	6	6	6	6	6	6
Priorities	**DRYLAND TRAINING**																																																			
1	General Athleticism & Core	50	50	50	50	50	50	50	50	50	50	50		50	10	10	10	10	10	10	10	10	10	10				10	10	10	10	10	10	80	80	80		10	10	10	30	30	30	10	10	10							
2	Maximum Strength & Hypertrophy	50	50	50	50	50	50	50	50	50	50	50		50	20	20	20	20	20	20	20	20	60	60	60	60	60	20	20	20	20	20	20	20	20	20					20	20	20	20	20	20							
3	Strength Endurance														70	70	70	70	70	70	70	70	30	30	20	20	20											20	20	20														
	Explosiveness & Power																								20	20	20	70	70	70	70	70	70									50	50	50											
	Power Endurance																																					70	70	70				70	70	70							
	Dryland Breakdown Warning (% Vol)																																																		
	IST INVOLVEMENT																																																		
	Physiological Monitoring																																																		
	Aerobic Capacity/Power																																																		
	Anaerobic Capacity/Power																																																		
	Recovery monitoring focus																																																		
	Strength testing																																																		
	Medical and FM Screening																																																		
	Specific Psych Focus points																																																	
	Massage therapy coverage																																																	



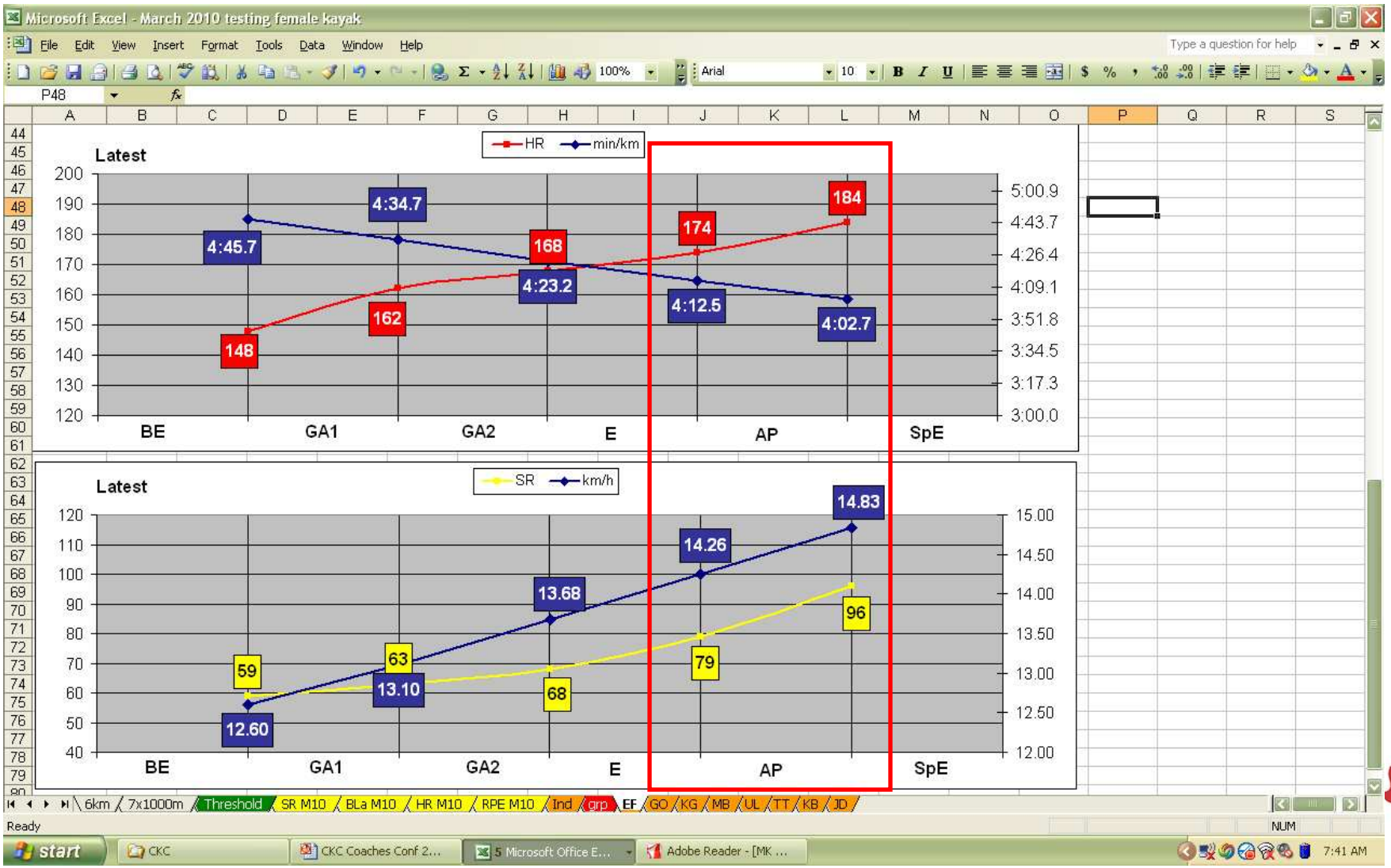


Training Zones

CKC Sprint Canoe-Kayak Energy Zones Terminology Summary

	Aerobic		Anaerobic			
			Lactic		Alactic (Phosphagen)	
	Capacity	Power	Capacity	Power	Capacity	Power
Approx Time for an all out effort	30min +	3-4min	2min	30-60sec	20 sec	6-10 sec
Intensity/Concept	Maximum worktime until this system is exhausted. This is at an intensity that has little anaerobic contribution	Work level is at a maximal Aerobic contribution (4min Intensity is at VO_{2max})	Maximum worktime until this system is exhausted	Highest sustained Power Output of a predominantly anaerobic contribution.	Maximum worktime until this system is exhausted and PCr is depleted	Maximal Power Output Generation, instant and explosive, uses ATP stores
Lactic Acid	Minimal (<4mmol/L)	Considerable production and accumulation, likely lower than Anaerobic Capacity (10+mmol/L)	Considerable production and accumulation (12+mmol/L)	Some production and accumulation (8+mmol/L)	None	None
Component Terms	Aerobic Endurance	Aerobic Power	Speed Endurance	Speed	Power	Explosiveness
Senior Canoe Assessments	6km paddle	1000m paddle	500m Paddle	200m paddle	Starts	Start
Aerobic Contribution %	98-99%	80%	70%	15%	0%	0%
Anaerobic Contribution %	1-2%	20%	30%	85%	100%	100%

Training Zones



Max Aerobic Power

- How do we get speed at MAP?
  - On water? Off Water? Lab?

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Max Aerobic Power

- How do we get speed at MAP?
  - On water? Off Water? Lab?
- 4 min effort, even pace
- On water, 1000m
  - Can also do 1500m on track off water
  - Or distance run in 5min on track
- Simple as average speed over an evenly paced all out effort

Off water MAP example

	Distance run in 5min										
	1667 m		Pred vVO_{2max}:	20.00	$km.h^{-1}$						
			Pred VO_{2max}:	64.74	$ml.kg^{-1}.min^{-1}$						
	Speed		Time for…								
	$km.h^{-1}$	$m.s^{-1}$	1000	800	500	400	260	250	200	100	50
100%	20.0	5.56	3:00.0	2:24.0	1:30.0	1:12.0	0:46.8	0:45.0	0:36.0	0:18.0	0:09.0
98%	19.6	5.45	3:03.6	2:26.9	1:31.8	1:13.5	0:47.7	0:45.9	0:36.7	0:18.4	0:09.2
95%	18.6	5.17	3:13.3	2:34.6	1:36.7	1:17.3	0:50.3	0:48.3	0:38.7	0:19.3	0:09.7
90%	16.8	4.66	3:34.8	2:51.8	1:47.4	1:25.9	0:55.8	0:53.7	0:43.0	0:21.5	0:10.7

- Distance run in 5min
- Distance run was 1667m, avg speed was 20 km/h

On water MAP example, 3:49

Vel @ MAP (km/h)	**15.7**	*Enter MAP speed in km/h*							
	GA1	GA2	E1	E2	E3	E3	AN1	AN1	AN2
% MAP (%)	**80%**	**85%**	**90%**	**95%**	**100%**	**105%**	**110%**	**115%**	**120%**
Speed (km/h)	12.6	13.4	14.2	14.9	15.7	16.5	17.3	18.1	18.9
m/s	3.50	3.71	3.93	4.15	4.37	4.59	4.81	5.02	5.24
min/mile	07:41	07:13	06:49	06:28	06:08	05:51	05:35	05:20	05:07
min/km	04:46	04:29	04:14	04:01	03:49	03:38	03:28	03:19	03:11

- Match training zones
  - Communication of time/distance expectation

Vel @ MAP (km/h)	15.7	Enter MAP speed in km/h							
	GA1	GA2	E1	E2	E3	E3	AN1	AN1	AN2
% MAP (%)	80%	85%	90%	95%	100%	105%	110%	115%	120%
Speed (km/h)	12.6	13.3	14.1	14.9	15.7	16.5	17.3	18.1	18.8
m/s	3.49	3.71	3.93	4.14	4.36	4.58	4.80	5.02	5.23
min/mile	07:41	07:14	06:50	06:29	06:09	05:52	05:36	05:21	05:08
min/km	04:47	04:30	04:15	04:01	03:49	03:38	03:28	03:19	03:11
time to cover (m)	min:sec.ms								
12.5	00:03.6	00:03.4	00:03.2	00:03.0	00:02.9	00:02.7	00:02.6	00:02.5	00:02.4
50	00:14.3	00:13.5	00:12.7	00:12.1	00:11.5	00:10.9	00:10.4	00:10.0	00:09.6
100	00:28.7	00:27.0	00:25.5	00:24.1	00:22.9	00:21.8	00:20.8	00:19.9	00:19.1
200	00:57.3	00:54.0	00:51.0	00:48.3	00:45.9	00:43.7	00:41.7	00:39.9	00:38.2
250	01:11.7	01:07.4	01:03.7	01:00.3	00:57.3	00:54.6	00:52.1	00:49.8	00:47.8
500	02:23.3	02:14.9	02:07.4	02:00.7	01:54.6	01:49.2	01:44.2	01:39.7	01:35.5
750	03:35.0	03:22.3	03:11.1	03:01.0	02:52.0	02:43.8	02:36.3		
1000	04:46.6	04:29.8	04:14.8	04:01.4	03:49.3	03:38.4	03:28.5		
2000	09:33.2	08:59.5	08:29.6	08:02.7					
Distance covered in (min:sec)	meters								
0:20	70	74	79	83	87	92	96	100	105
0:30	105	111	118	124	131	137	144	150	157
0:40	140	148	157	166	174	183	192	201	209
1:00	209	222	236	249	262	275	288	301	314
1:30	314	334	353	373	393	412	432	451	
2:00	419	445	471	497	523	550	576		
2:30	523	556	589	621	654	687	720		
3:00	628	667	706	746	785	824	863		
3:30	733	778	824	870	916	962			
4:00	837	890	942	994	1047	1099			
4:30	942	1001	1060	1119	1178				
5:00	1047	1112	1178	1243					
6:00	1256	1335	1413	1492					
8:00	1675	1779	1884	1989					
10:00	2093	2224	2355	2486					
15:00	3140	3336	3533						
20:00	4187	4448	4710						

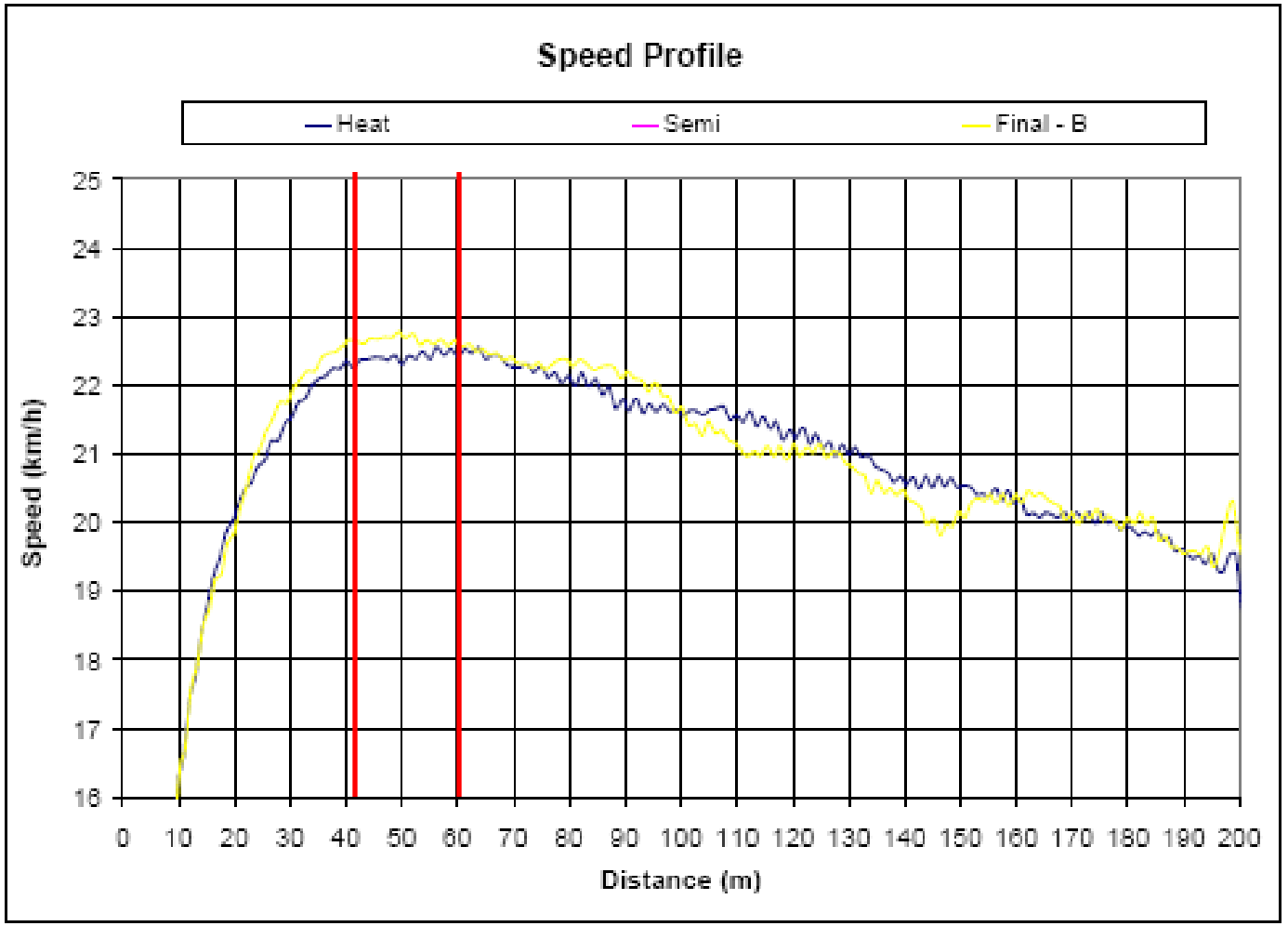
E1		duration							
sets	reps	m	time	rep rest	set rest	total work	total time	Week	Distance at Pace
1	4	2355	10:00	3:00	5:00	40:00	0:57:00	1	9420
1	3	3533	15:00	3:00	5:00	45:00	0:59:00	2	10598
1	2	4710	20:00	5:00	5:00	40:00	0:55:00	3	9420
All done at speeds between				14.9	14.1				

E3		duration							
sets	reps	m	time	rep rest	set rest	total work	total time	Week	
2	12	262	1:00	1:30	10:00	24:00	1:02:00	1	6280
2	8	393	1:30	2:00	10:00	24:00	1:00:00	1	6280
2	6	523	2:00	2:30	10:00	24:00	0:59:00	2	6280
2	4	654	2:30	3:00	10:00	20:00	0:52:00	2	5233
1	6	785	3:00	5:00	0:00	18:00	0:48:00	3	4710
1	5	916	3:30	5:00	0:00	17:30	0:42:30	3	4579
1	4	1047	4:00	5:00	0:00	16:00	0:36:00	4	4187
1	3	1178	4:30	5:00	0:00	13:30	0:28:30	4	3533
All done at speeds between				16.5	15.7				

AN1		duration							
sets	reps	m	time	rep rest	set rest	total work	total time	Week	
3	3	432	1:30	3:00	10:00	13:30	0:52:30	1	3886
2	4	576	2:00	3:00	10:00	16:00	0:48:00	1	4605
2	3	720	2:30	3:00	10:00	15:00	0:44:00	2	4318
1	4	863	3:00	7:00	0:00	12:00	0:40:00	2	3454
3	6	201	0:40	3:00	10:00	12:00	1:00:00	3	3611
2	6	301	1:00	3:00	10:00	12:00	0:50:00	3	3611
3	3	451	1:30	4:00	10:00	13:30	0:55:30	4	4062
All done at speeds between				18.1	17.3				

AN2		duration							
sets	reps	m	time	rep rest	set rest	total work	total time	Week	
4	10	105	0:20	1:40	10:00	13:20	1:10:00	1	4187
3	10	157	0:30	3:00	10:00	15:00	1:15:00	2	4710
3	5	209	0:40	5:00	10:00	10:00	1:05:00	3	3140
3	4	314	1:00	5:00	10:00	12:00	1:02:00	4	3768
All done at speeds between				18.8	18.5				

Race Analysis – 200m



Using race analysis info

- What can we improve and how do we do it?
  - Know how you race
  - Know how your competition races
  - Know your performance indicators

	Dober willows K2 A final Szeged 2009 Wcup				
	Time		distance		
	sec	%	Cumulative	actual	%
Acc	11sec	31%	0 to 55m	55m	27.5%
Max	3sec	8%	55 to 66m	11m	5.5%
Dec	22sec	61%	66 to 200m	134m	67.0%

Acceleration Phase

- 6-20 reps submax as warm up, then 3-5 reps max
- initially done submax then max
- no additional load ! (no bungee)
- you do not want to change the dynamic structure of the movement
- demand high movement quality. (how to judge?)
- good to compete, go head to head
- ideally done in good conditions to start with then perhaps progressed to more challenging ones (windy) as need to ensure good movement pattern execution
- acceleration phase (around 10sec) should always result in max speed being attained (i.e. 23km/h for MK2)

Maximum Speed Phase

- varying speed efforts (up/down/up continuous)
- 5-10sec max efforts (lower speeds would be in addition to this)
- emphasis on frequency and good technique with max boat movement velocity
- could "pre-load" in this instance, bungee flying sprints followed by no bungee
- do not accumulate metabolic fatigue
- Need complete regeneration for this to be effective. Good for Monday afternoon work
- rest period between reps dictated by achieving the same movement velocity/distance as previous rep
- consider stroke count
- progression pieces finishing at top speed (5 gears)
- need to emphasize the ability to "relax" within the cycle
- speed increased within a rep or from one rep to another
- could explore reducing rest until SR or stroke count could not be maintained

Deceleration Phase

- Speed Endurance
- 20 - ?s (20-45s)
- 4-8reps
- min 95% best time (98% would be better!)
- best 50m time of 12.0sec: so needs to be maximum of 12.24 for 98% and 12.6 for 95%
- would allow greater tolerance in the prep phase (93% = 12.84sec)
- can be active rest
- 2-4 sets of 8 reps
- 3min rest between sets, 60-90sec between reps

Summary

- Plan – the series of tests
- Be consistent – stick to the plan
- Use a broad range – 1-2 for each zone
- It is what you do with the information that counts

Stroke rate and speed